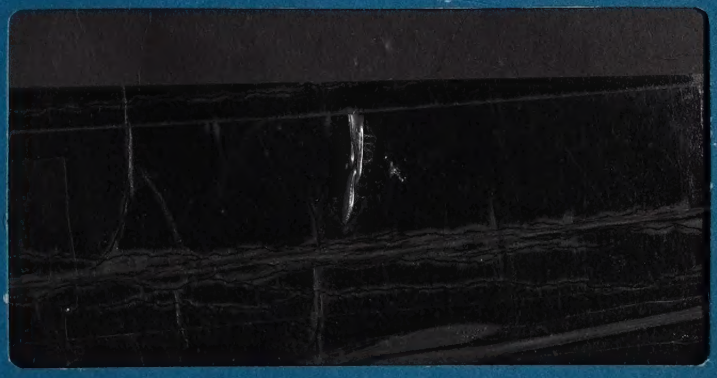
INSTRUCTION MANUAL

REGULATED POWER SUPPLIES



LAMBDA

LAMBDA ELECTRONICS MELVILLE, L. I., N. Y.

FOR KENNEDY PWR CAB 11/08/88

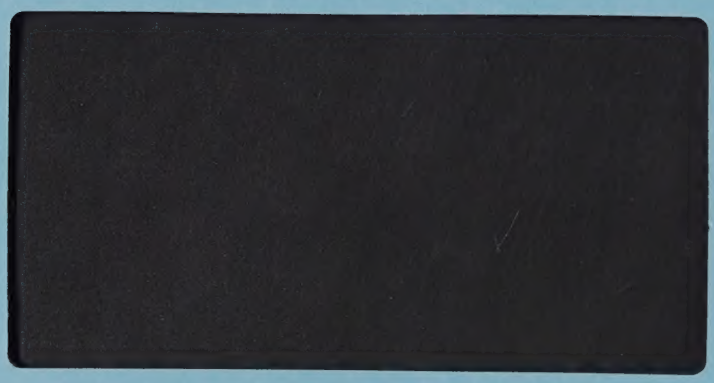


TABLE OF CONTENTS

ADDENDA

ADDED PARTS LIST

SCHEMATIC (Size A and B)

STD INSTRUCTION MANUALS: LFS-45-12, LFS-46-12, LFS-48-5, LRA-17

ASSEMBLY INSTRUCTION MANUAL FOR LAMBDA STD POWER SYSTEMS II

ASSEMBLY #21870-1

ADDENDA

ASSEMBLY #21870-1

Lambda Assembly #21870-1 consists of the following supplies and accessories:

(1) LRA-17	Rack Adapter
(1) LFS-48-5	Power Supply
(1) LFS-46-12	Power Supply
(1) LFS-45-12	Power Supply
(2) MBS-1220-22	EMI Filter

The power supplies are mounted in the rack adapter. The AC control and meter panel is mounted to the rack adapter, and wired to the power supplies. The AC input and DC output for the entire assembly is through barrier strips and power studs mounted at the rear of the rack adapter.

The front panel is per Configuration 4 of the 1987 Lambda Catalog with the AC on/off switch and fuse replaced a two pole series trip circuit breaker.* Each power supply is provided with an EMI. The remote on/off terminal for each supply is provided at a barrier strip at the rear of the assembly. Separate terminals for each power supply. The AC input to the assembly is 105-132 VAC at 47-440 Hz, IP=52A.

*One circuit breaker for the LF-48-5 and one circuit breaker for the remaining supplies.

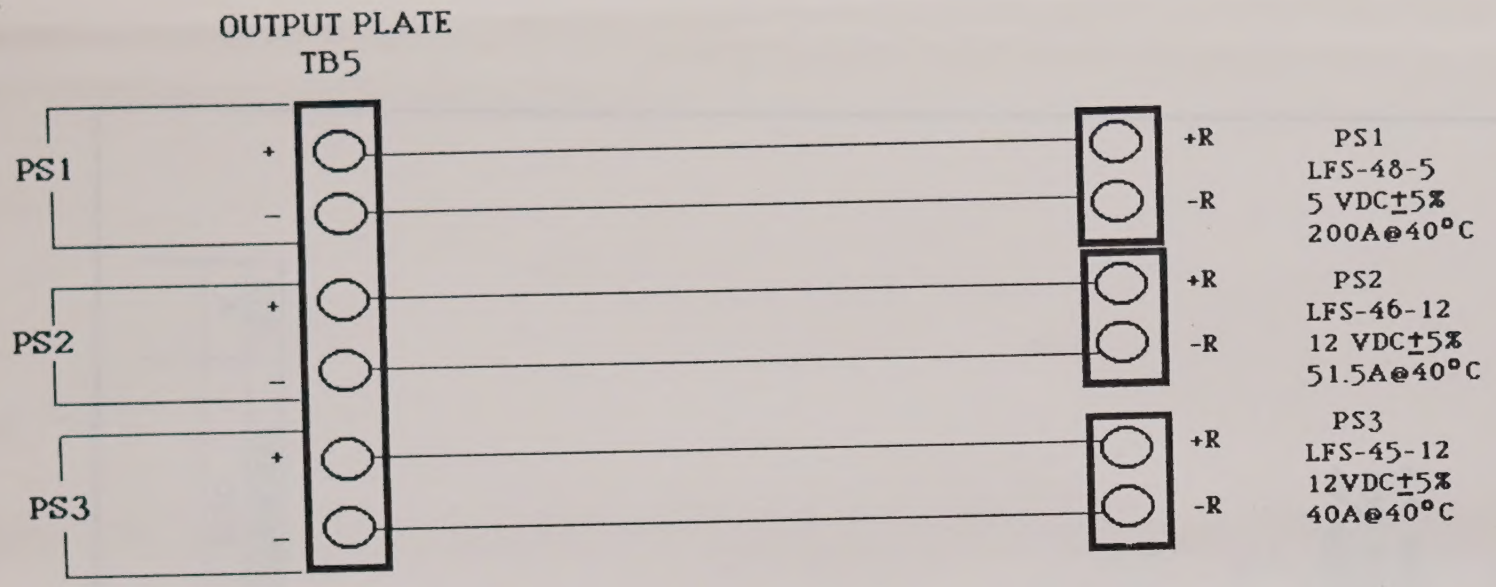
Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_10904

DEVIATION FROM AND/OR ADDED PARTS TO STANDARD ELECTRICAL PARTS LIST

ASSEMBLY #21870-1

CIRCUIT DESIG.	DESCRIPTION	LAMBDA NO.
CB-1	Circuit Breaker, 30A, 2 pole, Series Trip	FHE-30-012
SH-1	Empro MLB-500-50 Shunt, 500A, 50mv	SP-21870-1-SH
LF-1	Corcom EMI Filter #30K6	SP-21870-1-LF
LF-2, 3	EMI Filter	MBS-1220-22



PS1
LFS-48-5
5 VDC±5%
200A@40°C

PS2
LFS-46-12
12 VDC±5%
51.5A@40°C

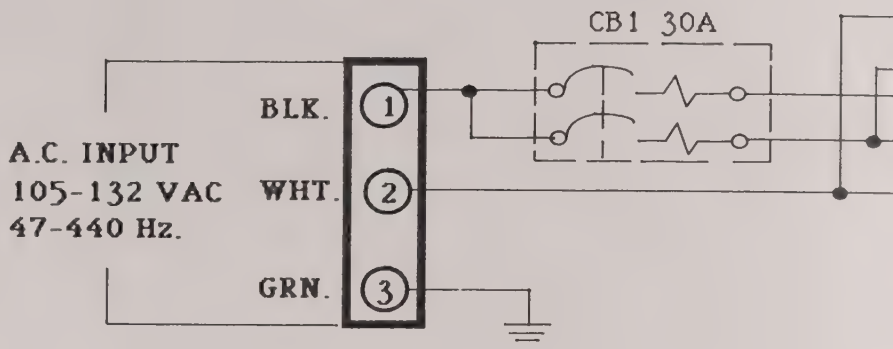
PS3
LFS-45-12
12VDC±5%
40A@40°C

SYM	DESCRIPTION	DATE	APPL.
A	ORIG M.T.	8-27-87	S.C.

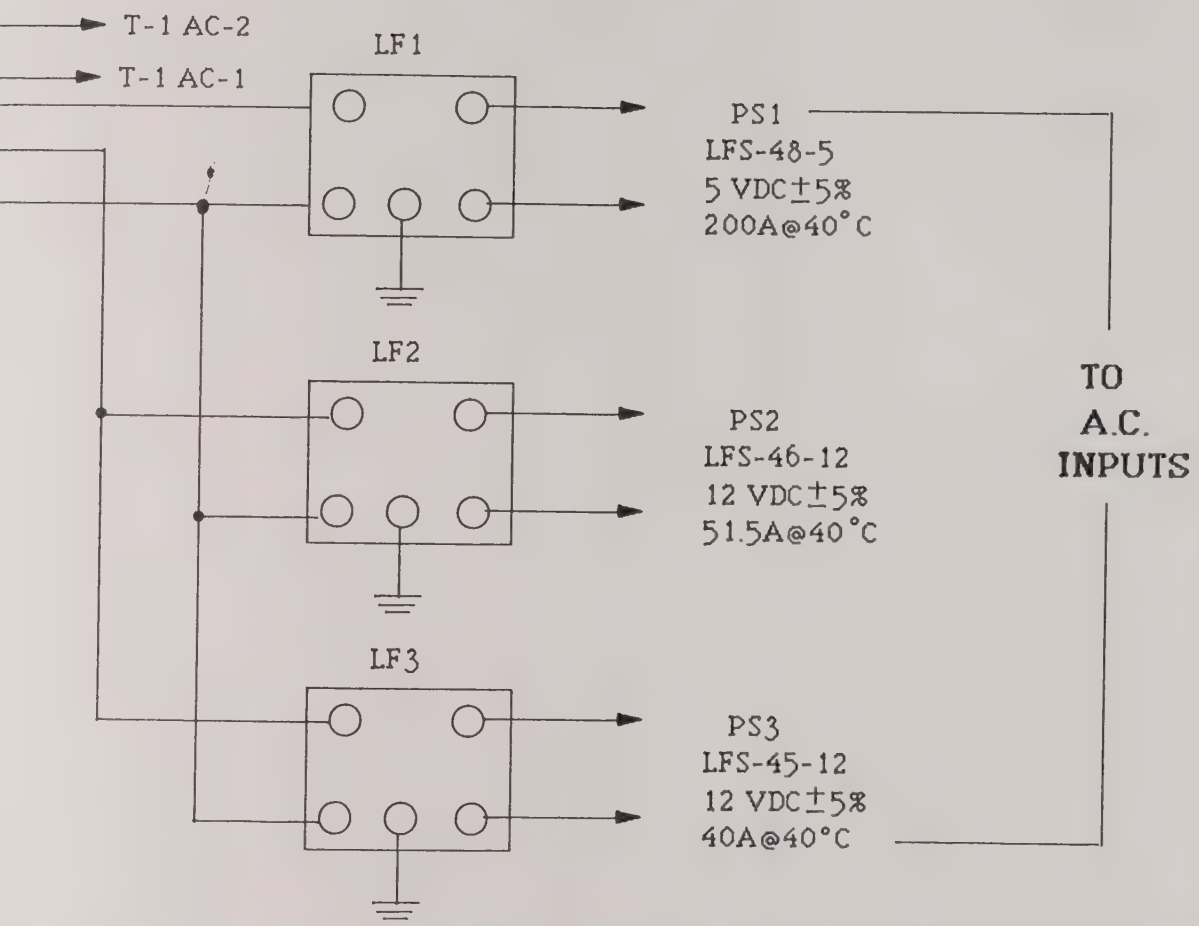
LAMBDA ELECTRONICS inc.
MELVILLE NEW YORK

INTERWIRING DIAGRAM
ASSY.#21870-1

SHEET 2 OF 2



SYM	DESCRIPTION	DATE	APPL.
A	ORIG M.T.	8-27-97	S.C.



LAMBDA ELECTRONICS inc.

MELVILLE NEW YORK

INTERWIRING DIAGRAM

ASSY.#21870-1

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LFS-45 SERIES

SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. For voltage and current ratings see table I below.

TABLE I

MODEL	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE		
		40°C	50°	60°C
LFS-45-2	2 ± 5%	90.0	67.5	45.0
LFS-45-5	5 ± 5%	90.0	67.5	45.0
LFS-45-6	6 ± 5%	75.0	56.0	37.5
LFS-45-12	12 ± 5%	40.0	30.0	20.0
LFS-45-15	15 ± 5%	32.5	24.5	16.0
LFS-45-20	20 ± 5%	25.0	19.0	12.5
LFS-45-24	24 ± 5%	20.0	15.0	10.0
LFS-45-28	28 ± 5%	17.5	13.0	8.5
LFS-45-48	48 ± 5%	10.0	7.5	5.0

Current range must be chosen to suit the appropriate maximum temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation (line) . . . . . 0.1% from 95 to 132 VAC or 187 to 265 VAC or 260-370 VDC.

Regulation (load) . . . . . 0.1% from 0 to full load.

Ripple and Noise . . . . . 15 mV rms, 75 mV peak-to-peak for LFS-45-2, -5 and -6; 20 mV rms, 150 mV peak-to-peak for LFS-45-12 through LFS-45-28; 35 mV rms, 200 mV peak-to-peak for LFS-45-48 (20 MHz bandwidth measurement system). Ripple specifications apply for output terminals floating or with either positive or negative terminal grounded.

Temperature Coefficient . . . . . 0.03% per °C

Remote Programming

External Resistor . . . . . Nominal 1000 Ohms/volt output. Increasing resistance increases output voltage. Use a low temperature coefficient resistor to assure most stable operation.

Programming Voltage . . . . . One-to-one voltage change. The programming supply must have a reverse current capability of 2 ma min.

Remote Sensing . . . . . Provision is made for remote sensing to eliminate the effect of power output lead resistance on DC regulation. Sensing leads should be a twisted pair to minimize AC pickup. A 10 µf elect, capacitor may be required between output terminals and sense terminals to reduce noise pickup. An additional capacitor may also be required across the load to further reduce noise pick up; the value of this capacitor will depend upon the particular application.

OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure.

AC INPUT — 95 to 132 volts AC at 47 to 440 Hz, or 187 to 265 VAC at 47 to 440 Hz via field selectable jumper. (When shipped from factory, all LFS-45 power supplies are wired for 95 to 132 VAC input. To configure for 187 to 265 VAC input, remove jumper between P.C. Board terminals 'A' and 'B'). Where applicable, regulatory agency approval applies only for input voltages up to 250 VAC and for input frequencies in the range 47-63 Hz. Leakage current in the ground connection may exceed the limits allowed by these agencies at frequencies above this range.

DC INPUT — 260 to 370 volts DC (unit must be configured for 187 to 265 VAC as described above). Where applicable, regulatory agency approval only applies for input voltages up to 350 VDC.

EFFICIENCY — LFS-45-2 55% minimum, LFS-45-5 through LFS-45-15 75% minimum, LFS-45-20 through LFS-45-48 80% minimum.

INRUSH LIMITING — Turn on inrush current will not exceed 40 amps peak.

OVERLOAD PROTECTION — Automatic electronic current limiting circuit limits the output to a preset value, thereby providing protection for the load as well as the power supply. The current limit characteristic exhibits a region of constant current behavior (down to approximately 50% Vo (nominal)) followed by a foldback region.

HOLD UP TIME — LFS-45-2, LFS-45-5 and LFS-45-6 models will remain within regulation limits for at least 16.7 msec after loss of AC power when operating at maximum output power and 105 VAC input at 60 Hz, (or when configured for 220 V input: 20 msec holdup when operating at maximum output power and 210 VAC input at 50 Hz).

RECOMMENDED FUSING — 15 A, 250 V normal blow fuse in AC line (not supplied in unit) for 110 VAC input. Use 10A, 250 V for 220 VAC input.

INPUT AND OUTPUT CONNECTIONS — See outline drawing for location. AC input, sensing and remote on/off connections are made via PC board mounted terminal blocks. Ground connection is made via a chassis mounted solder terminal. DC output connections are made via heavy duty bus bars.

REMOTE TURN-ON/TURN-OFF — T^2L compatable signal enables remote turn-on/off of the power supply. A voltage of 2.8 to 5.0 V applied between "+R" and "-R" will initiate turn-off. Open circuit or short circuit condition, or a zero to 1.0 volt signal will cause turn-on.

COOLING — Convection cooled; no external blowers required.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to +60°C ambient with corresponding load current ratings for all modes of operation. Unit will start up at -10°C, but may not meet published specs until internal heating raises temperature to 0°C.

STORAGE TEMPERATURE — -55°C to +85°C.

DC OUTPUT CONTROL — Screwdriver voltage adjust control permits adjustment of DC output voltage. See outline drawing for location of control.

WARRANTY — 1 year warranty from date of shipment . . . materials and labor

PHYSICAL DATA

Size	1.9" x 4.75" x 16"
Weight	6 lbs. net; 7 lbs. shipping
Finish	Gray, FED.STD.595 No. 26081

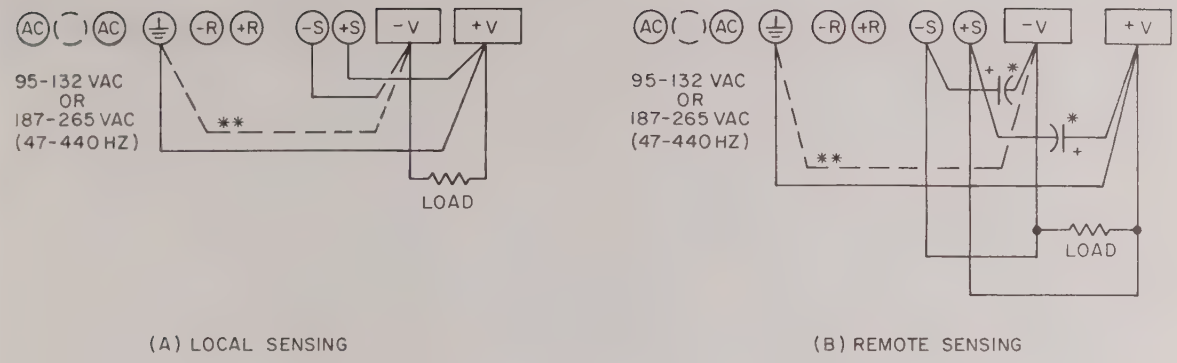
MOUNTING — One surface with threaded mounting holes can be utilized for mounting this unit. All LFS-45 power supplies must be mounted in a horizontal plane with 4.75" dimension vertical. Air circulation is required when unit is mounted in confined areas. Refer to outline drawing for mounting details.

OVERVOLTAGE PROTECTION — Standard on all models. If output voltage increases above a preset level, inverter drive is removed. Maximum overvoltage detect level: LFS-45-2 4.2 V, LFS-45-5 6.85 V, LFS-45-6 7.6 V, LFS-45-12 14.9 V, LFS-45-15 19.3 V, LFS-45-20 26.5 V, LFS-45-24 31.5 V, LFS-45-28 36.7 V, LFS-45-48 60.6 V.

ISOLATION RATINGS — Input terminals to output: 3750 V rms
Input terminals to ground: 1500 V rms
Output terminals to ground: 500 V rms

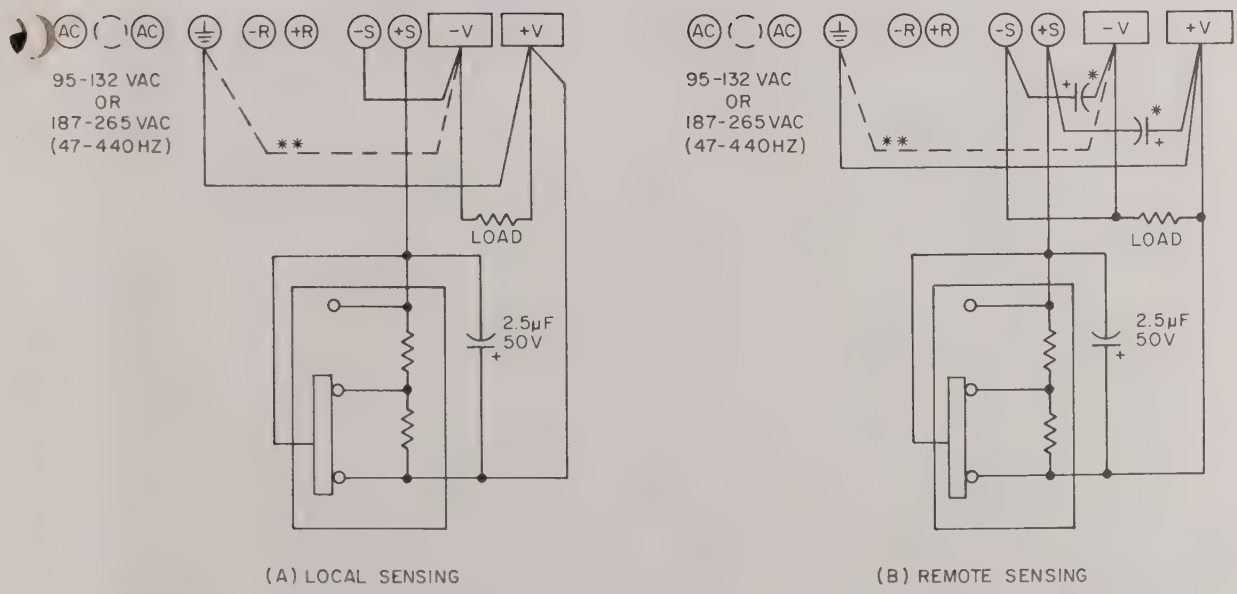
ACCESSORIES

Rack Adapters	Rack adapter LRA-17, with or without chassis slides, is available for all LFS-45 units.
Standard Power Systems	All LFS power supplies can be integrated into the Lambda standard power system assembly which provides panel mounted pilot light, voltage control, fuse and output metering for the power supply as desired.



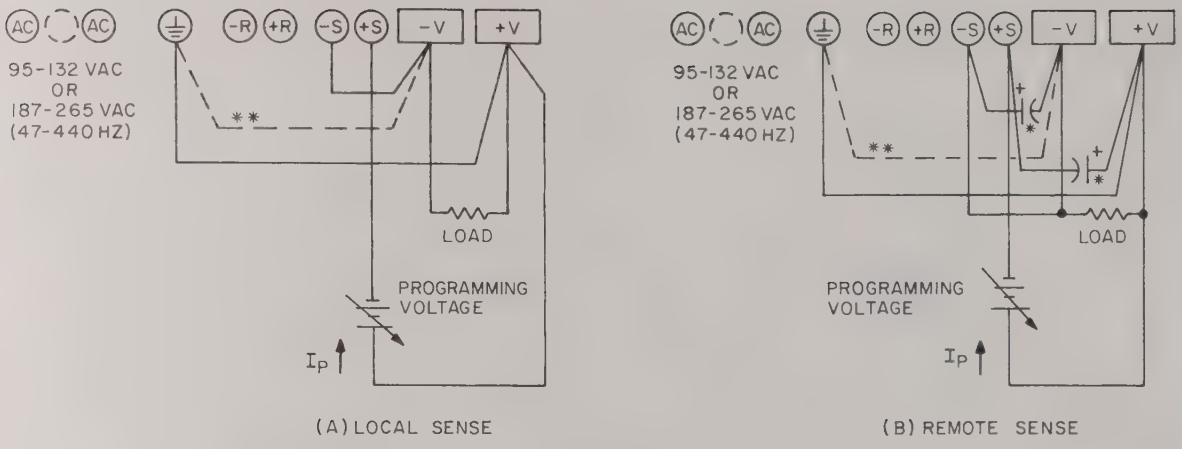
* A 10μF, ELECT. CAP MAY BE REQUIRED.
** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V

Figure 1. DC Output Connections



* A 10μF, ELECT CAP MAY BE REQUIRED.
** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V.

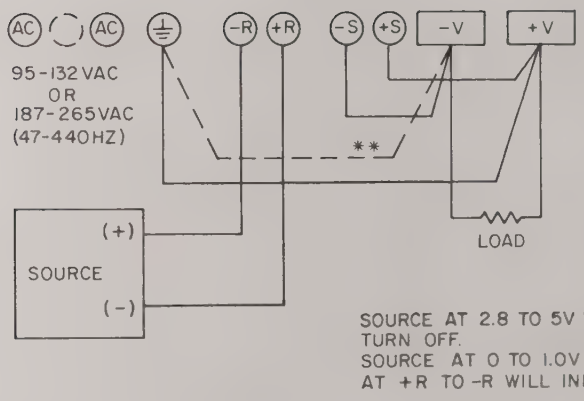
Figure 2. Programmable Voltage, With External Resistor



*A 10μF, ELECT CAP MAY BE REQUIRED.

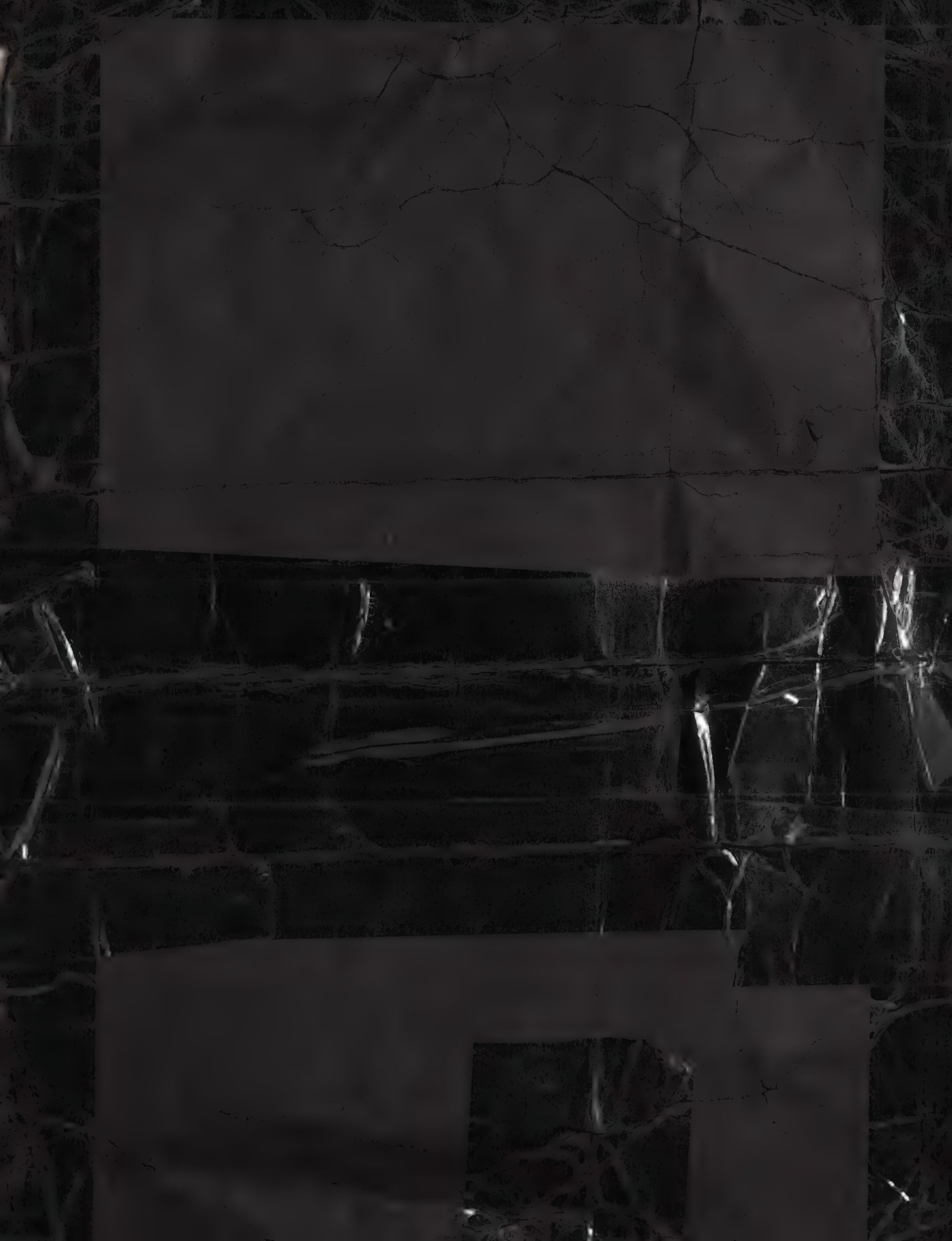
**FOR NEGATIVE GROUND DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V.

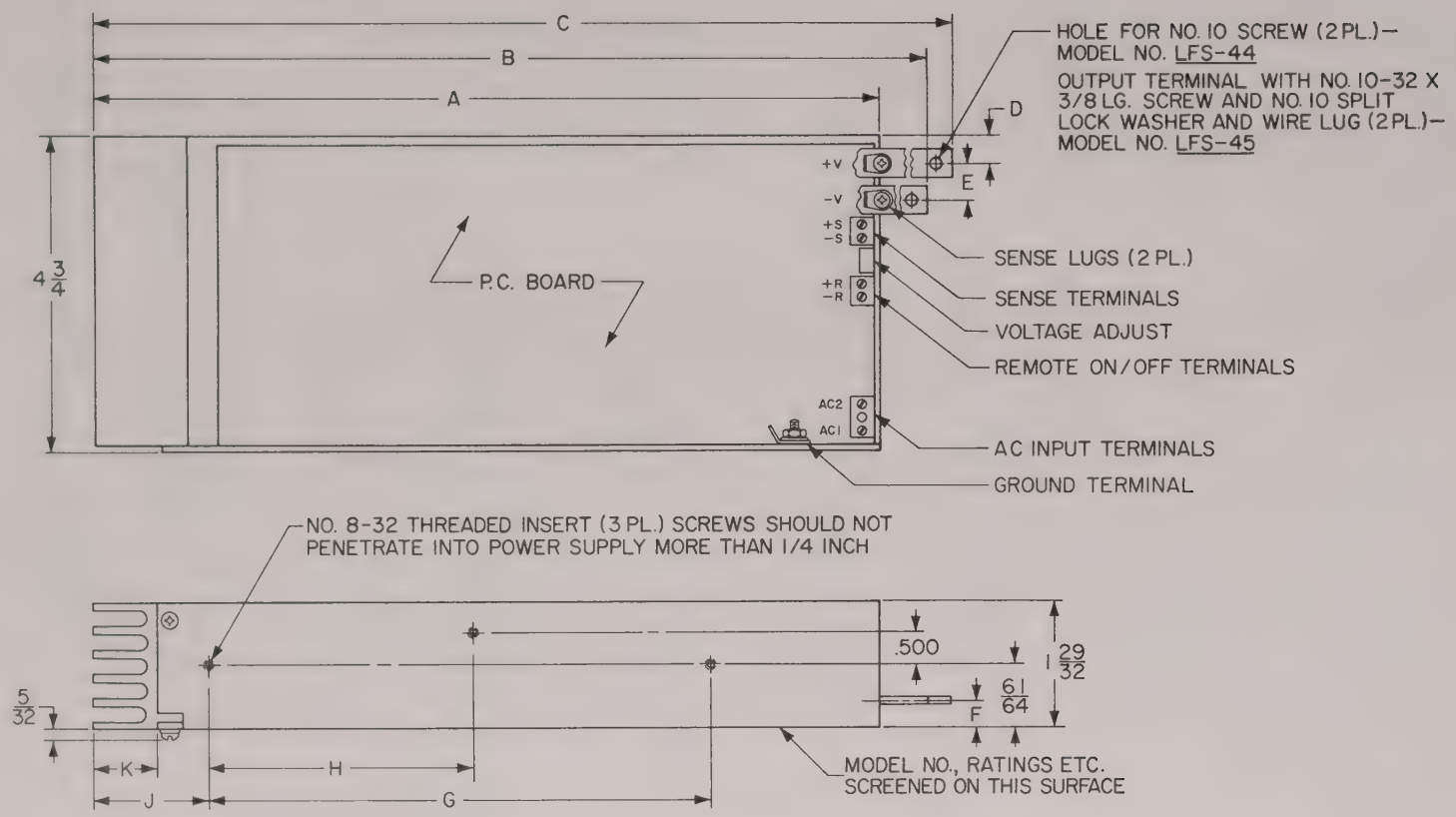
Figure 3. Programmable Voltage, With External Voltage Source



**FOR NEGATIVE GROUND DISCONNECT JUMPER FROM TERMINALS ⏚ AND +V AND RECONNECT TO TERMINALS ⏚ AND -V.

Figure 4. Remote Turn-On/Turn-Off





Outline Drawing

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LFS-46 SERIES

SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. For voltage and current ratings see table I below.

TABLE I

MODEL	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE		
		40°C	50°C	60°C
LFS-46-2	2 ± 5%	120.0	112.0	93.5
LFS-46-5	5 ± 5%	120.0	112.0	93.5
LFS-46-6	6 ± 5%	101.0	94.5	79.0
LFS-46-12	12 ± 5%	51.5	48.0	40.0
LFS-46-15	15 ± 5%	42.0	39.0	33.0
LFS-46-20	20 ± 5%	32.0	30.0	25.0
LFS-46-24	24 ± 5%	27.0	25.0	21.0
LFS-46-28	28 ± 5%	23.0	21.5	18.0
LFS-46-48	48 ± 5%	13.5	12.5	10.5

Current range must be chosen to suit the appropriate maximum temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation (line) . . . . . 0.1% from 95 to 132 VAC or 187 to 265 VAC or 260-370 VDC.

Regulation (load) . . . . . 0.1% from 0 to full load.

Ripple and Noise . . . . . 15 mV rms, 75 mV peak-to-peak for LFS-46-2, -5 and -6; 20 mV rms, 150 mV peak-to-peak for LFS-46-12 through LFS-46-28; 35 mV rms, 200 mV peak-to-peak for LFS-46-48 (20 MHz bandwidth measurement system). Ripple specifications apply for output terminals floating or with either positive or negative terminal grounded.

Temperature Coefficient . . . . . 0.03% per °C

Remote Programming

External Resistor . . . . . Nominal 1000 Ohms/volt output. Increasing resistance increases output voltage. Use a low temperature coefficient resistor to assure most stable operation.

Programming Voltage . . . . . One-to-one voltage change. The programming supply must have a reverse current capability of 2 ma min.

Remote Sensing . . . . . Provision is made for remote sensing to eliminate the effect of power output lead resistance on DC regulation. Sensing leads should be a twisted pair to minimize AC pickup. A 10 μf elect, capacitor may be required between output terminals and sense terminals to reduce noise pickup. An additional capacitor may also be required across the load to further reduce noise pick up; the value of this capacitor will depend upon the particular application.

OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure.

AC INPUT — 95 to 132 volts AC at 47 to 440 Hz, or 187 to 265 VAC at 47 to 440 Hz. (Refer to connection diagrams for proper connections.) Where applicable, regulatory agency approval applies only for input voltages up to 250 VAC and for input frequencies in the range 47-63 Hz. Leakage current in the ground connection may exceed the limits allowed by these agencies at frequencies above this range.

DC INPUT — 260 to 370 volts DC (unit must be wired in the 187 to 265 VAC configuration). Where applicable, regulatory agency approval only applies for input voltages up to 350 VDC.

EFFICIENCY — LFS-46-2 55% minimum, LFS-46-5 through LFS-46-15 75% minimum, LFS-46-20 through LFS-46-48 80% minimum.

INRUSH LIMITING — Turn on inrush current will not exceed 75 amps peak.

OVERLOAD PROTECTION — Automatic electronic current limiting circuit limits the output to a preset value, thereby providing protection for the load as well as the power supply. The current limit characteristic exhibits a region of constant current behavior (down to approximately 50% Vo (nominal)) followed by a foldback region.

HOLD UP TIME — LFS-46-2, LFS-46-5 and LFS-46-6 models will remain within regulation limits for at least 16.7 msec after loss of AC power when operating at maximum output power and 105 VAC input at 60 Hz, (or when configured for 220 V input: 20 msec holdup when operating at maximum output power and 210 VAC input at 50 Hz).

RECOMMENDED FUSING — 25 A, 250 V normal blow fuse in AC line (not supplied in unit) for 110 VAC input. Use 12A, 250 V for 220 VAC input.

INPUT AND OUTPUT CONNECTIONS — See outline drawing for location. AC input, sensing and remote on/off connections are made via PC board mounted terminal blocks. Ground connection is made via a chassis mounted terminal. DC output connections are made via heavy duty bus bars.

REMOTE TURN-ON/TURN-OFF — T^2L compatable signal enables remote turn-on/off of the power supply. A voltage of 2.8 to 5.0 V applied between "+R" and "-R" will initiate turn-off. Open circuit or short circuit condition, or a zero to 0.5 volt signal will cause turn-on.

COOLING — Unit is fan cooled. Fan failure circuit shuts down inverter in event of fan failure or interference of fan rotation. LED overtemperature indicator will light. AC input power must be momentarily interrupted to restore output after fault condition is corrected.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to +60°C ambient with corresponding load current ratings for all modes of operation. Unit will start up at -10°C, but may not meet published specs until internal heating raises temperature to 0°C.

STORAGE TEMPERATURE — -55°C to +85°C

DC OUTPUT CONTROL — Screwdriver voltage adjust control permits adjustment of DC output voltage. See outline drawing for location of control.

WARRANTY — 1 year warranty from date of shipment. . .materials and labor

PHYSICAL DATA

Size	7.25" x 5.0" x 4.875"
Weight	8 lbs. 12 oz. net; 11 lbs. 12 oz. shipping
Finish	Gray, FED.STD.595 No. 26081

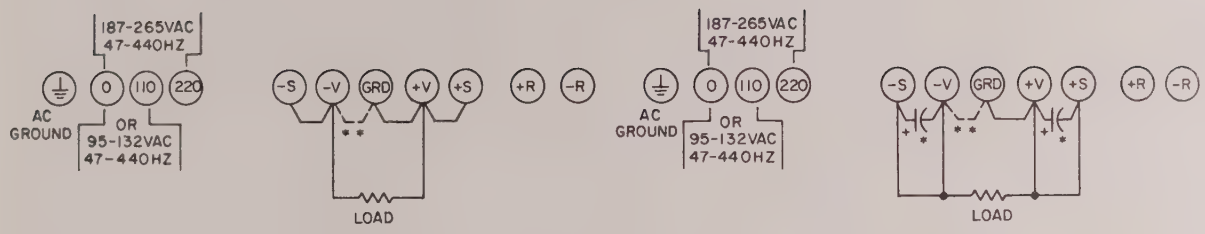
MOUNTING — One mounting surface. Forced air cooling will permit multiple mounting positions.

OVERVOLTAGE PROTECTION — Standard on all models. If output voltage increases above a preset level, inverter drive is removed. Maximum overvoltage detect level: LFS-46-2 4.2 V, LFS-46-5 6.85 V, LFS-46-6 7.6 V, LFS-46-12 14.9 V, LFS-46-15 19.3 V, LFS-46-20 26.5 V, LFS-46-24 31.5 V, LFS-46-28 36.7 V, LFS-46-48 60.6 V.

ISOLATION RATINGS - Input terminals to output: 3750 V rms
Input terminals to ground: 1500 V rms
Output terminals to ground: 500 V rms

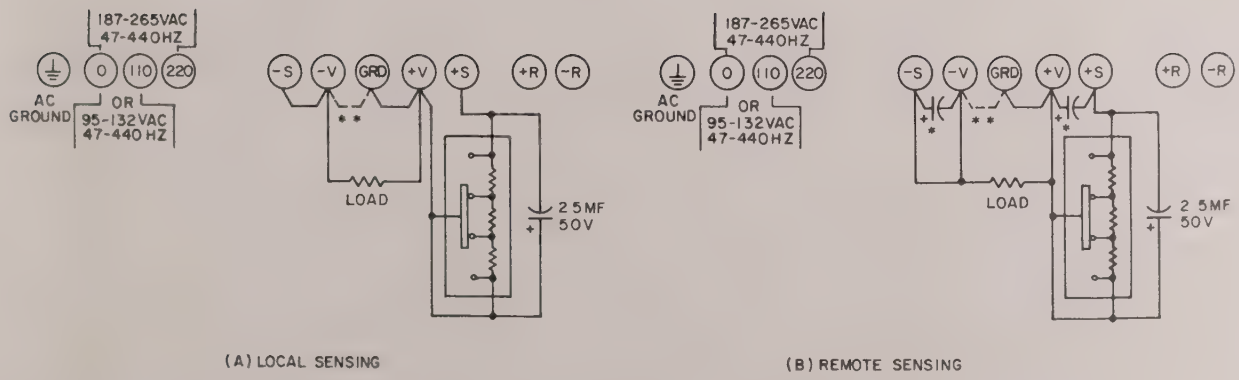
ACCESSORIES

Rack Adapters	Rack adapters LRA-15 and LRA-17, with or without chassis slides, are available for all LFS units.
Standard Power Systems	All LFS power supplies can be integrated into the Lambda standard power system assembly which provides panel mounted pilot light, voltage control, fuse and output metering for the power supply as desired.



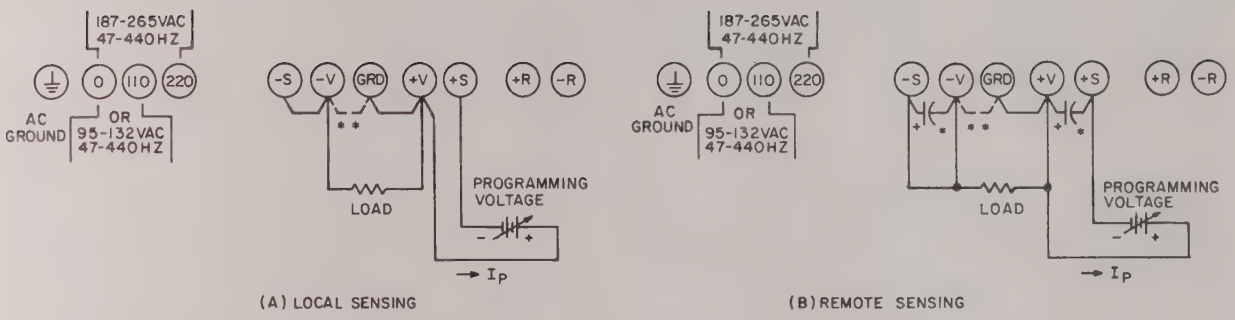
* A 10MF, ELECT., CAP. MAY BE REQUIRED.
** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 1. DC Output Connections



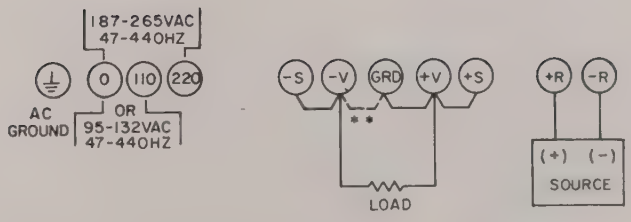
* A 10MF, ELECT., CAP. MAY BE REQUIRED.
** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 2. Programmable Voltage, With External Resistor



* A 10MF, ELECT., CAP. MAY BE REQUIRED.
** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

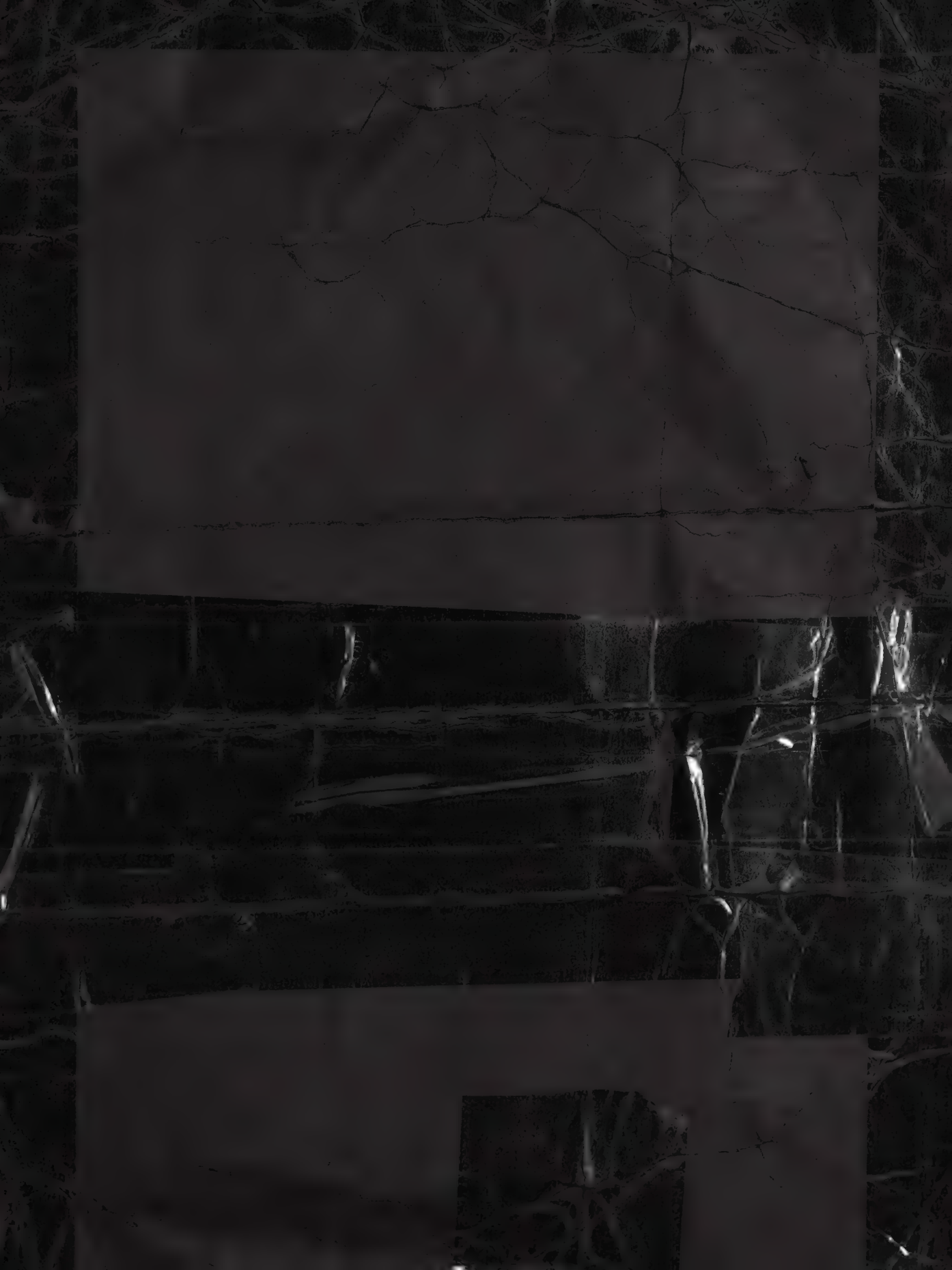
Figure 3. Programmable Voltage, With External Voltage Source

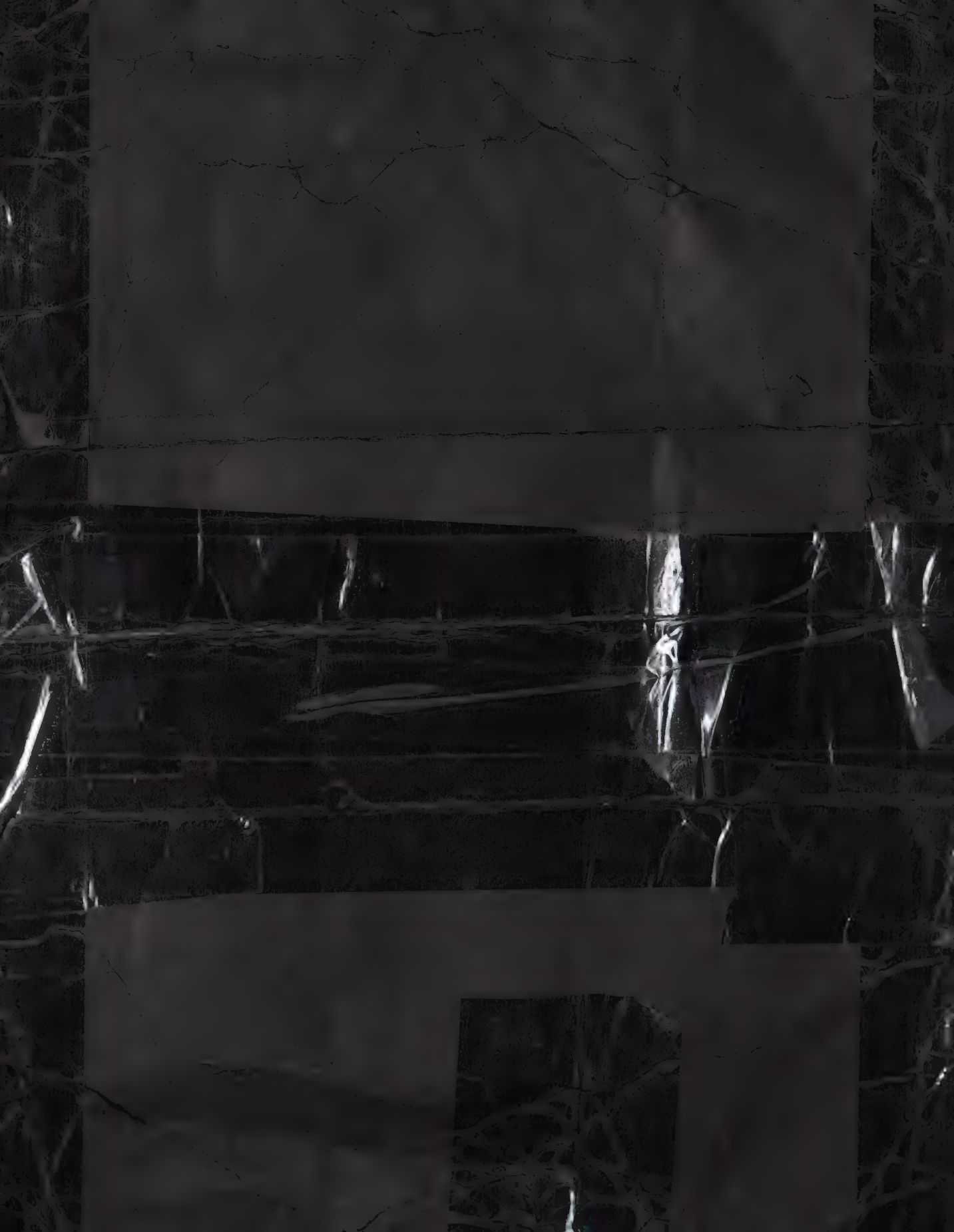


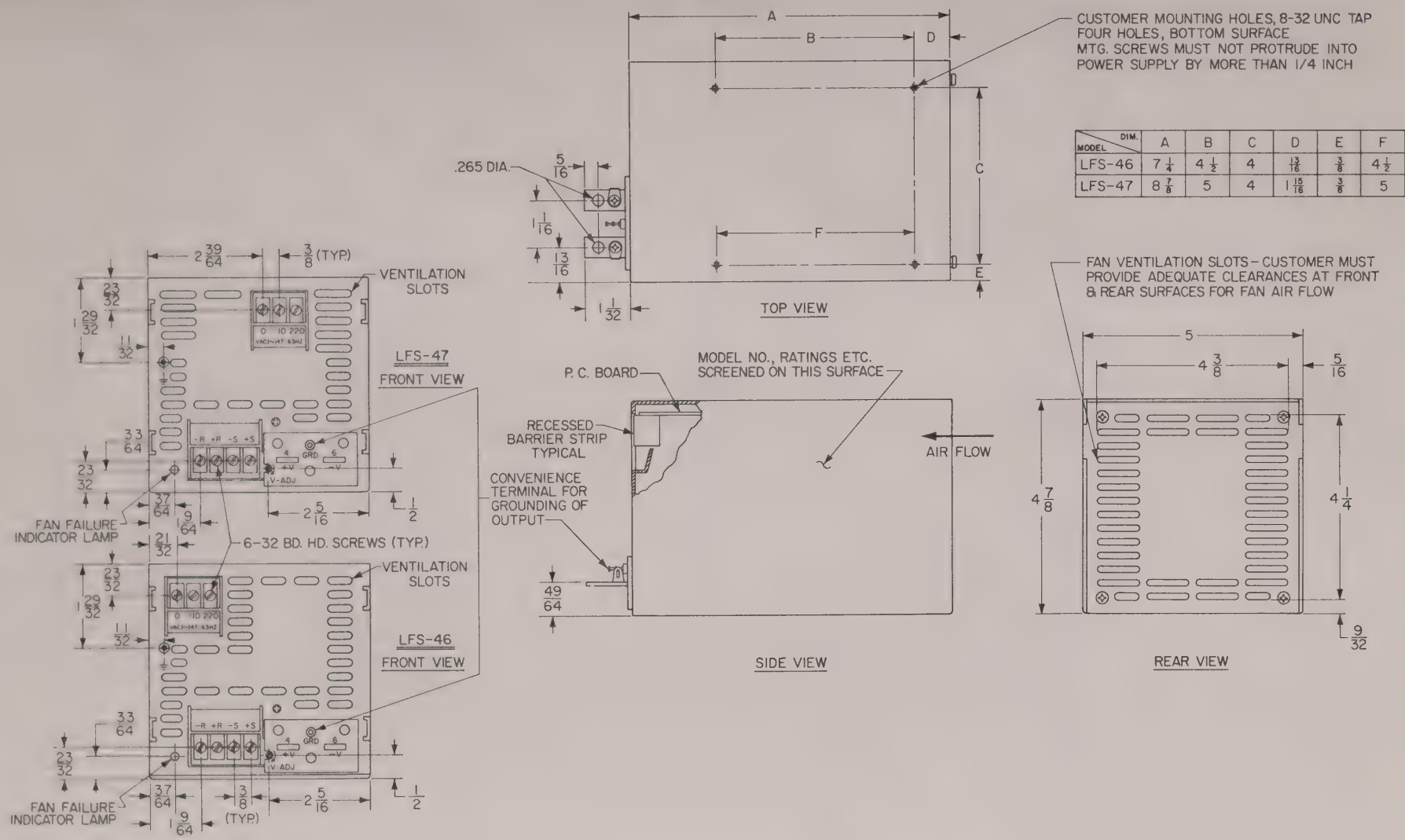
SOURCE AT 2.8 TO 5V WILL INITIATE TURN-OFF;
SOURCE AT 0 TO 0.5V, OPEN CIRCUIT, OR SHORT CIRCUIT AT +R TO -R WILL INITIATE TURN-ON.

** FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 4. Remote Turn-on/Turn-off







Outline Drawing

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LFS-48 SERIES

SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. For voltage and current ratings see table I below.

TABLE I

MODEL	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE		
		40°C	50°C	60°C
LFS-48-2	2 ± 5%	200.0	185.0	157.0
LFS-48-5	5 ± 5%	200.0	185.0	157.0
LFS-48-6	6 ± 5%	168.0	155.0	132.0
LFS-48-12	12 ± 5%	86.0	79.5	67.5
LFS-48-15	15 ± 5%	70.0	64.5	55.0
LFS-48-20	20 ± 5%	53.0	49.0	41.5
LFS-48-24	24 ± 5%	44.5	40.5	35.0
LFS-48-28	28 ± 5%	38.5	35.0	30.0
LFS-48-48	48 ± 5%	22.5	20.5	17.5

Current range must be chosen to suit the appropriate maximum temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation (line) . . . . . 0.1% from 95 to 132 VAC or 187 to 265 VAC or 260-370 VDC.

Regulation (load) . . . . . 0.1% from 0 to full load.

Ripple and Noise . . . . . 15 mV rms, 75 mV peak-to-peak for LFS-48-2, -5 and -6; 20 mV rms, 150 mV peak-to-peak for LFS-48-12 through LFS-48-28; 35 mV rms, 200 mV peak-to-peak for LFS-48-48 (20 MHz bandwidth measurement system). Ripple specifications apply for output terminals floating or with either positive or negative terminal grounded.

Temperature Coefficient . . . . . 0.03% per °C

Remote Programming

External Resistor . . . . . Nominal 1000 Ohms/volt output. Increasing resistance increases output voltage. Use a low temperature coefficient resistor to assure most stable operation.

Programming Voltage . . . . . One-to-one voltage change. The programming supply must have a reverse current capability of 2 ma min.

Remote Sensing . . . . . Provision is made for remote sensing to eliminate the effect of power output lead resistance on DC regulation. Sensing leads should be a twisted pair to minimize AC pickup. A 10 uf elect, capacitor may be required between output terminals and sense terminals to reduce noise pickup. An additional capacitor may also be required across the load to further reduce noise pick up; the value of this capacitor will depend upon the particular application.

OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure.

AC INPUT — 95 to 132 volts AC at 47 to 440 Hz, or 187 to 265 VAC at 47 to 440 Hz. (Refer to connection diagrams for proper connections.) Where applicable, regulatory agency approval applies only for input voltages up to 250 VAC and for input frequencies in the range 47-63 Hz. Leakage current in the ground connection may exceed the limits allowed by these agencies at frequencies above this range.

DC INPUT — 260 to 370 volts DC (unit must be wired in the 187 to 265 VAC configuration). Where applicable, regulatory agency approval only applies for input voltages up to 350 VDC.

EFFICIENCY — LFS-48-2 55% minimum, LFS-48-5 through LFS-48-15 75% minimum, LFS-48-20 through LFS-48-48 80% minimum.

INRUSH LIMITING — Turn on inrush current will not exceed 75 amps peak.

OVERLOAD PROTECTION — Automatic electronic current limiting circuit limits the output to a preset value, thereby providing protection for the load as well as the power supply. The current limit characteristic exhibits a region of constant current behavior (down to approximately 50% Vo (nominal)) followed by a foldback region.

HOLD UP TIME — LFS-48-2, LFS-48-5 and LFS-48-6 models will remain within regulation limits for at least 16.7 msec after loss of AC power when operating at maximum output power and 105 VAC input at 60 Hz, (or when configured for 220 V input: 20 msec holdup when operating at maximum output power and 210 VAC input at 50 Hz).

RECOMMENDED FUSING — 40 A, 250 V normal blow fuse in AC line (not supplied in unit) for 110 VAC input. Use 20A, 250 V for 220 VAC input.

INPUT AND OUTPUT CONNECTIONS — See outline drawing for location. AC input, sensing and remote on/off connections are made via PC board mounted terminal blocks. Ground connection is made via a chassis mounted terminal. DC output connections are made via heavy duty bus bars.

REMOTE TURN-ON/TURN-OFF — T^2L compatable signal enables remote turn-on/off of the power supply. A voltage of 2.8 to 5.0 V applied between "+R" and "-R" will initiate turn-off. Open circuit or short circuit condition, or a zero to 0.5 volt signal will cause turn-on.

COOLING — Unit is fan cooled. Fan failure circuit shuts down inverter in event of fan failure or interference of fan rotation. LED overtemperature indicator will light. AC input power must be momentarily interrupted to restore output after fault condition is corrected.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to +60°C ambient with corresponding load current ratings for all modes of operation. Unit will start up at -10°C, but may not meet published specs until internal heating raises temperature to 0°C.

STORAGE TEMPERATURE — -55°C to +85°C

DC OUTPUT CONTROL — Screwdriver voltage adjust control permits adjustment of DC output voltage. See outline drawing for location of control.

WARRANTY — 1 year warranty from date of shipment . . . materials and labor

PHYSICAL DATA

Size	11" x 5" x 4.875"
Weight	12 lbs. 5 oz. net; 15 lbs. 5 oz. shipping
Finish	Gray, FED.STD.595 No. 26081

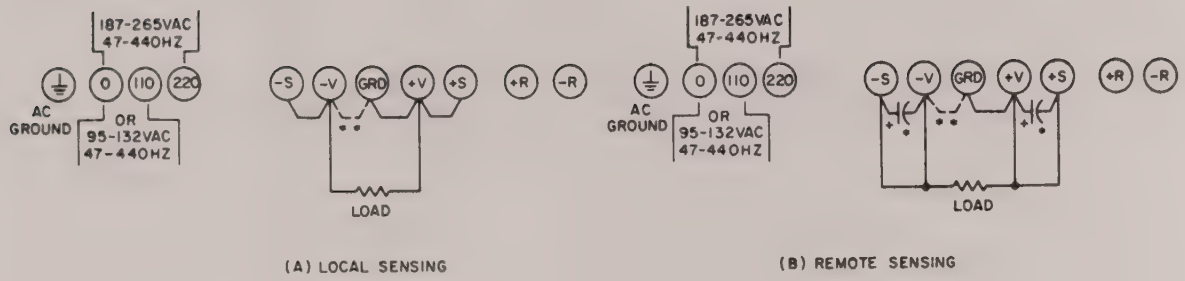
MOUNTING — One mounting surface. Forced air cooling will permit multiple mounting positions.

OVERVOLTAGE PROTECTION — Standard on all models. If output voltage increases above a preset level, inverter drive is removed. Maximum overvoltage detect level: LFS-48-2 4.2 V, LFS-48-5 6.85 V, LFS-48-6 7.6 V, LFS-48-12 14.9 V, LFS-48-15 19.3 V, LFS-48-20 26.5 V, LFS-48-24 31.5 V, LFS-48-28 36.7 V, LFS-48-48 60.6 V.

ISOLATION RATINGS — Input terminals to output: 3750 V rms
Input terminals to ground: 1500 V rms
Output terminals to ground: 500 V rms

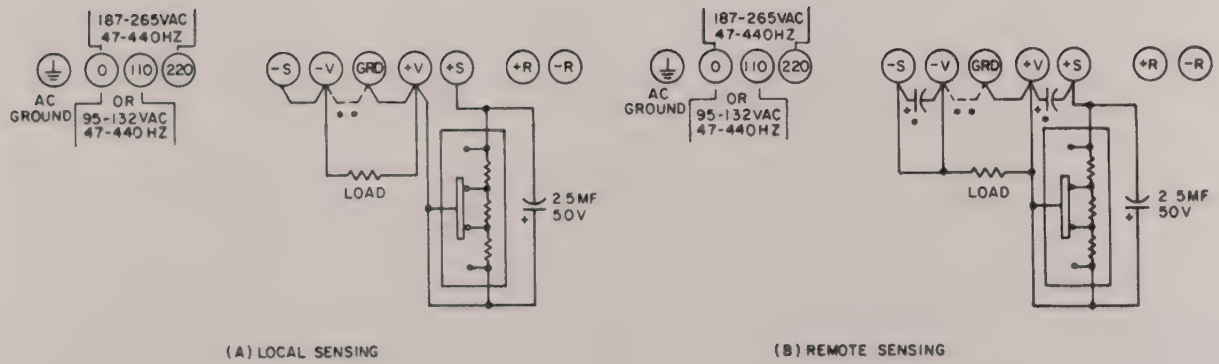
ACCESSORIES

Rack Adapters	Rack adapters LRA-15 and LRA-17, with or without chassis slides, are available for all LFS units.
Standard Power Systems	All LFS power supplies can be integrated into the Lambda standard power system assembly which provides panel mounted pilot light, voltage control, fuse and output metering for the power supply as desired.



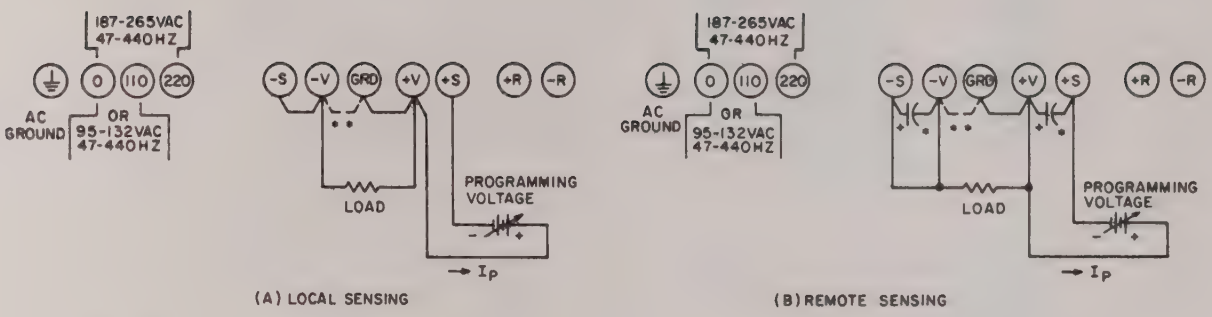
• A 10MF, ELECT., CAP. MAY BE REQUIRED.
•• FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 1. DC Output Connections



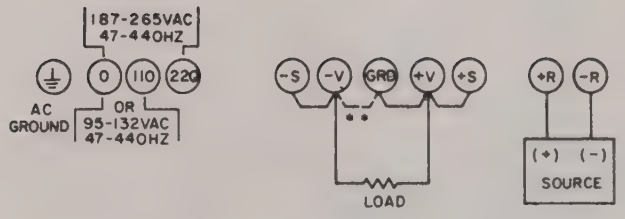
• A 10MF, ELECT., CAP. MAY BE REQUIRED.
•• FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 2. Programmable Voltage, With External Resistor



* A 10MF, ELECT., CAP. MAY BE REQUIRED.
* * FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

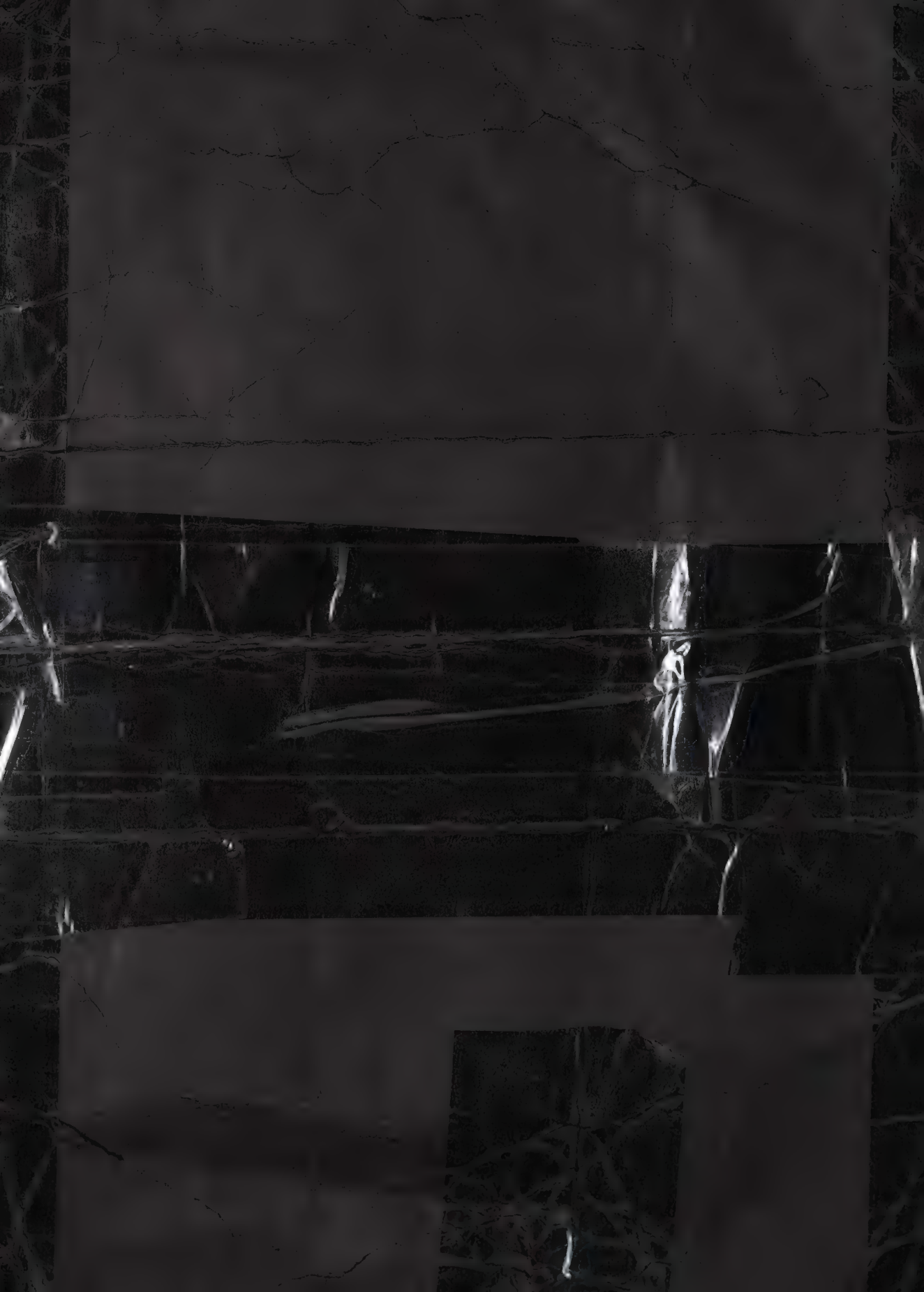
Figure 3. Programmable Voltage, With External Voltage Source

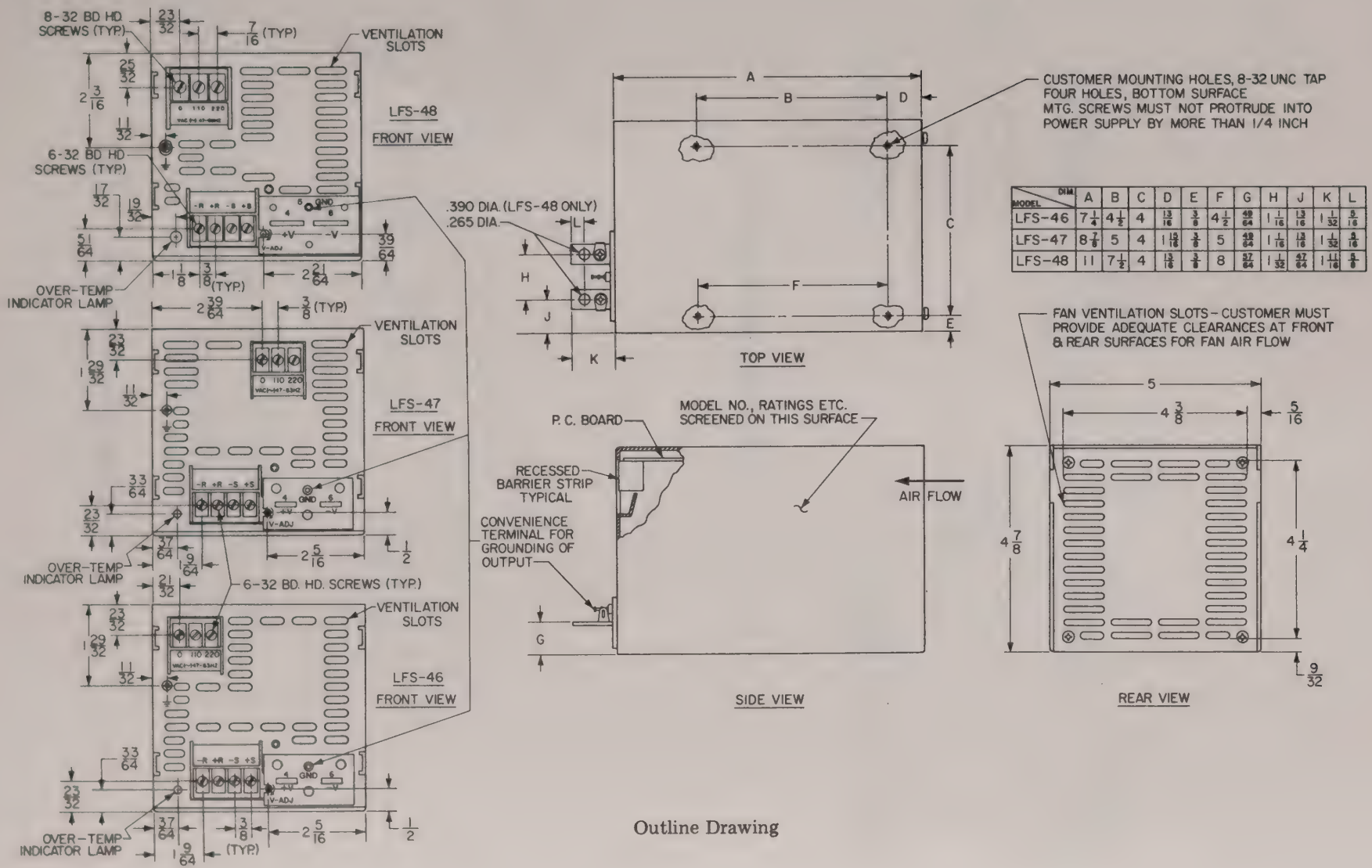


SOURCE AT 2.8 TO 5V WILL INITIATE TURN-OFF; SOURCE AT 0 TO 0.5V, OPEN CIRCUIT, OR SHORT CIRCUIT AT +R TO -R WILL INITIATE TURN-ON.

* * FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS GRD AND +V AND RECONNECT TO TERMINALS GRD AND -V.

Figure 4. Remote Turn-on/Turn-off





MODEL \ DIM	A	B	C	D	E	F	G	H	J	K	L
LFS-46	7 1/4	4 1/2	4	13/16	3/8	4 1/2	49/64	1 1/16	13/16	1 1/32	5/16
LFS-47	8 7/8	5	4	1 13/16	3/8	5	49/64	1 1/16	13/16	1 1/32	5/16
LFS-48	11	7 1/2	4	13/16	3/8	8	37/64	1 1/32	37/64	1 11/16	5/8

Outline Drawing

INSTRUCTION MANUAL

RACK ADAPTERS

LRA-14, LRA-15, LRA-16
AND LRA-17

LAMBDA

LAMBDA ELECTRONICS

MELVILLE, LI., NY.

GENERAL DESCRIPTION

Rack adapters LRA-14, LRA-15, LRA-16, and LRA-17 are designed for use in equipment racks where ruggedized mounting of LC, LG, LJ, LM, LN, LO, LV, LW, and/or LX modular power supplies is required. The adapter can be used with or without chassis slides.

Each rack adapter can be used to mount various combinations of modular power supplies. Refer to figures 1 through 4 for list of mounting capabilities.

MOUNTING CHASSIS SLIDES

Mount chassis slides using the following hardware. To assure unrestricted mounting of units into the adapter designated screw lengths must not be exceeded. Insert screws into designated holes and secure slide in position using the appropriate hex nuts, washers, & lockwashers.

LRA-14, -15:	CHASSIS TRAK nos.	114, 116, 118	- 10-32x5/8" fl-hd
	JONATHAN no.	130 Series	- 6-32x5/8" fl-hd
	GRANT PULLEY no.	4435 Slides	- 6-32x5/8" fl-hd
	LAMBDA SLIDE no.	KHT-34-012	- 6-32x3/8" pan-hd
LRA-16, -17:	CHASSIS TRAK no.	122	- 10-32x1/2" fl-hd
	LAMBDA SLIDE no.	KHT-44-013	- 8-32x3/8" truss-hd

INSTALLATION OF LJS-10, -13 UNITS INTO RACK ADAPTERS LRA-14 AND LRA-16

Bracket kit KT-36 is required for each LJS-10 or LJS-13 power supply to be mounted in rack adapter LRA-14 or LRA-16.

Install the LJS-10 or LJS-13 power supply into the rack adapter as follows:

1. Attach mounting brackets to the bottom of the power supply using the 6-32x3/8" pan hd. 2 pc. sems supplied with the bracket kit.

2. Position power supply and bracket assembly in the rack adapter so that the three tapped mounting holes on the bracket are aligned with the designated holes in the rack.

3. Insert three 8-32x7/16" thruss hd screws (supplied with rack adapter) from bottom of rack adapter to secure power supply and bracket in place. Terminal blocks on front mounted units face front. Terminal blocks on rear mounted units face rear.

INSTALLATION OF LN-Y, -Z AND LO-Y, -Z UNITS INTO RACK ADAPTERS LRA-14 AND LRA-16

Spacer kit KT-35 is required for each LN-Y, LN-Z, LO-Y, or LO-Z power supply to be mounted in rack adapter LRA-14 or LRA-16.

Install the LN-Y, LN-Z, LO-Y, or LO-Z power supply into the rack adapter as follows:

1. Remove cover on LN-Y or LN-Z power supply unit.

2. Attach the four spacers to the large mounting surface of the power supply using the 8-32x3/8" pan hd. 2 pc. sems supplied with the spacer kit.

3. If desired, the cover may be reinstalled on the LN-Y or LN-Z power supply.

4. Position power supply and spacer assembly in the rack adapter so that the tapped holes in the four spacers are aligned with designated holes in the rack.

5. Insert four 8-32 x 7/16" truss hd. screws (supplied with rack adapter) from bottom of rack adapter to secure power supply in place.

INSTALLATION OF POWER SUPPLY UNITS INTO RACK ADAPTERS (EXCEPT LJS-10, -13; LN-Y, -Z; LO-Y, Z INTO LRA-14, -16)

Install the power supply units into rack adapters as follows:

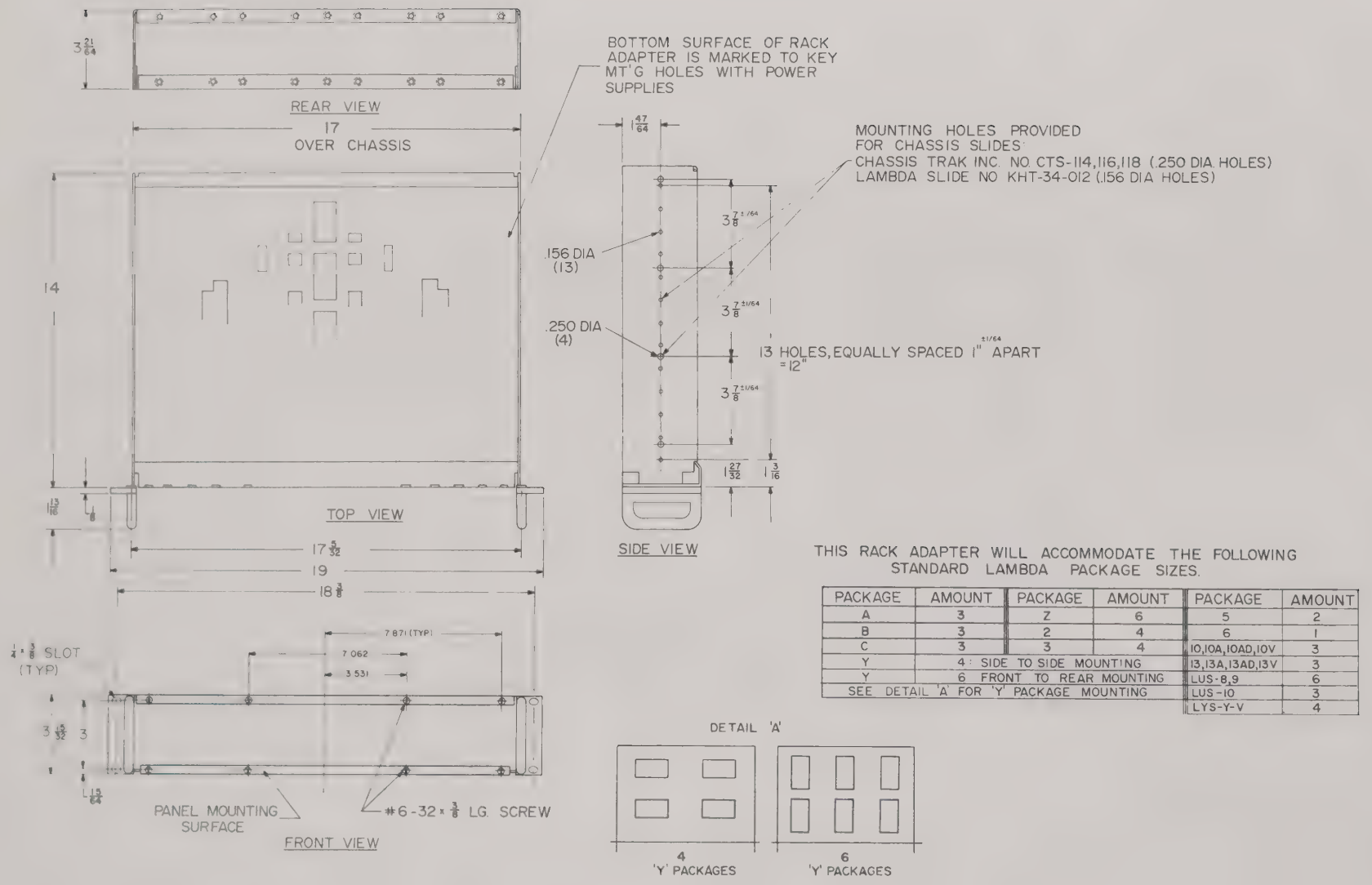
1. Position power supply unit in the rack adapter so that the tapped mounting holes on the bottom surface of the supply are aligned with designated holes in the rack.

2. Insert 6-32 x 3/8" pan hd. screws (package sizes 2, 3, 10, 11, 12, and 13), 8-32 x 3/8" truss hd. stainless steel screws (package sizes 7 and 8), or 8-32 x 7/16" truss hd. screws (all other package sizes) from bottom of rack adapter to secure power supply unit in place. Terminal blocks on front mounted units face front. Terminal blocks on rear mounted units face rear. Terminal blocks on package size 5 units face left in LRA-14 and LRA-15. Terminal blocks on package size 6 units face right in LRA-14 and left in LRA-15.

USING BLANK PANELS

Blank panels can be used to cover front opening of rack adapter. Blank panels and rack adapters that can be used together are listed below.

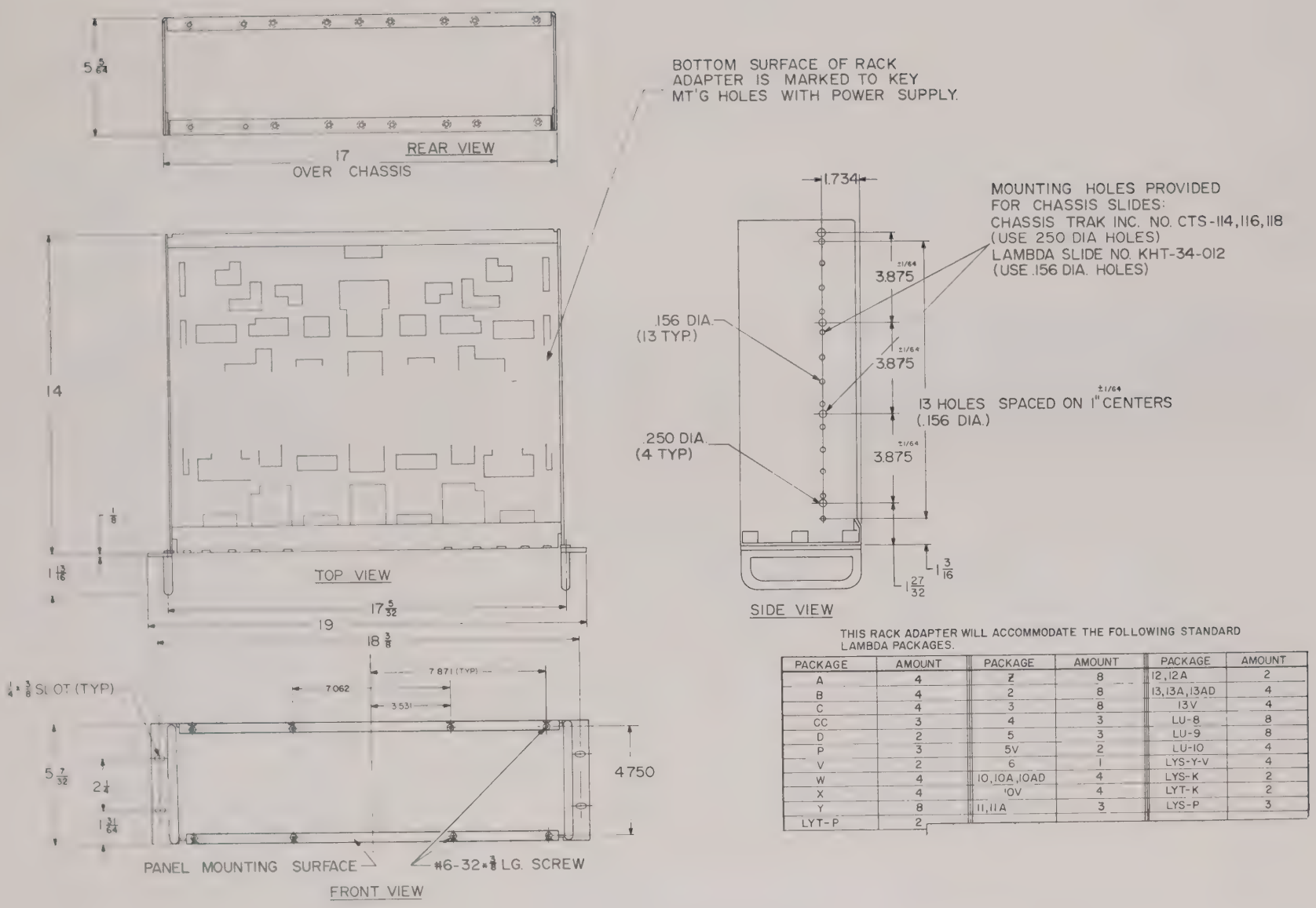
Rack Adapter	Blank Panel
LRA-14	SB-30
LRA-15	SB-50
LRA-16	SB-30
LRA-17	SB-50



THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGE SIZES.

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	3	Z	6	5	2
B	3	2	4	6	1
C	3	3	4	10,10A,10AD,10V	3
Y	4 : SIDE TO SIDE MOUNTING			13,13A,13AD,13V	3
Y	6 FRONT TO REAR MOUNTING			LUS-8,9	6
SEE DETAIL 'A' FOR 'Y' PACKAGE MOUNTING				LUS-10	3
				LYS-Y-V	4

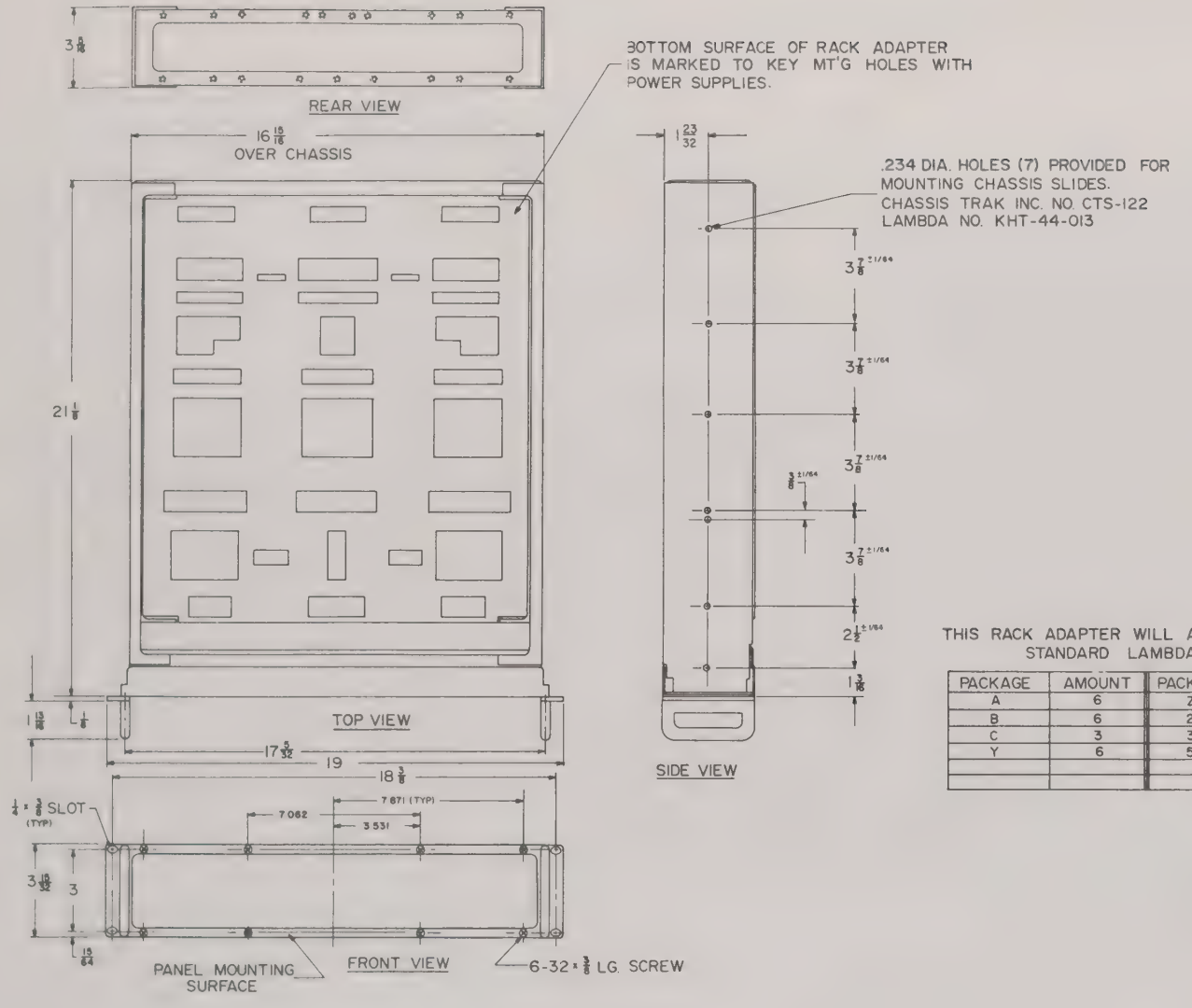
Figure 1. Outline Drawing, Rack Adapter LRA-14.



THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGES.

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	4	Z	8	12,12A	2
B	4	2	8	13,13A,13AD	4
C	4	3	8	13V	4
CC	3	4	3	LU-8	8
D	2	5	3	LU-9	8
P	3	5V	2	LU-10	4
V	2	6	1	LYS-Y-V	4
W	4	10,10A,10AD	4	LYS-K	2
X	4	10V	4	LYT-K	2
Y	8	11,11A	3	LYS-P	3
LYT-P	2				

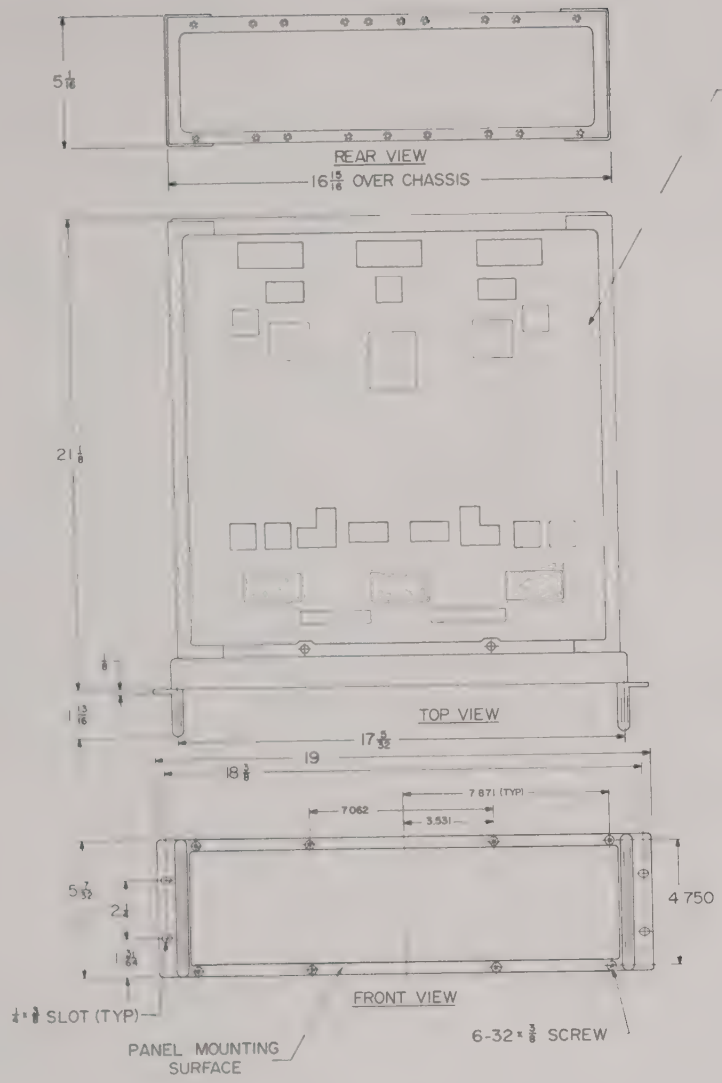
Figure 2. Outline Drawing, Rack Adapter LRA-15.



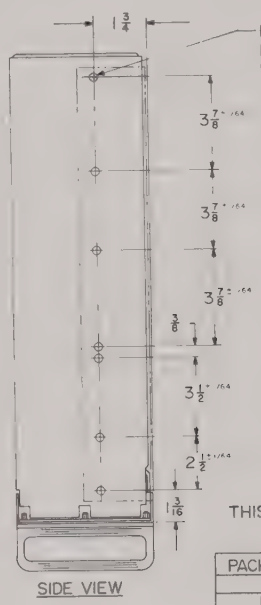
THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGE SIZES:

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	6	Z	6	6	2
B	6	2	8	10	6
C	3	3	8	10V	3
Y	6	5	3	13	6
				13V	6

Figure 3. Outline Drawing, Rack Adapter LRA-16.



BOTTOM SURFACE OF RACK ADAPTER IS MARKED TO KEY MT'G HOLES WITH POWER SUPPLIES.



THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGE SIZES

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	8	W	4	7	1
B	8	X	8	8	1
C	4	Y	8	10,10A,10AD	8
CC	3	Z	12	10V	4
CA	3	2	8	11,11A,11AD,11V	3
D	2	3	8	12,12A,12AD,12V	2
E	2	4	6	13,13A,13AD	8
EE	2	5	4	13V	8
P	3	5V	3	LYTP W/COVER	2
R	3	6	2	LYSK, LYTK	2
V	3	LUS-8,9,10	8	LYS-YV	8
				LYSD	2

Figure 4. Outline Drawing, Rack Adapter LRA-17.

5-Year
Guarantee
We warrant each instrument manufactured by us, and sold by us or our authorized agents, to be free from defects in material and workmanship, and that it will perform within applicable specifications for a period of five years after original shipment. Our obligation under this guarantee is limited to repairing or replacing any instrument or part thereof, (except tubes and fuses) which shall, within five years after delivery to the original purchaser, be returned to us with transportation charges prepaid, prove after our examination to be thus defective.
We reserve the right to discontinue instruments without notice, and to make modifications in design at any time without incurring any obligation to make such modifications to instruments previously sold.

LAMBDA ELECTRONICS
515 BROAD HOLLOW ROAD • MELVILLE, L. I., NEW YORK • 516 MYRTLE 4-4200

DIVISION of Veeco INSTRUMENTS INC

6/86

INSTRUCTION MANUAL

RACK ADAPTERS

LRA-14, LRA-15, LRA-16
AND LRA-17

LAMBDA

LAMBDA ELECTRONICS MELVILLE, LI., NY.

GENERAL DESCRIPTION

Rack adapters LRA-14, LRA-15, LRA-16, and LRA-17 are designed for use in equipment racks where ruggedized mounting of LC, LG, LJ, LM, LN, LO, LV, LW, and/or LX modular power supplies is required. The adapter can be used with or without chassis slides.

Each rack adapter can be used to mount various combinations of modular power supplies. Refer to figures 1 through 4 for list of mounting capabilities.

MOUNTING CHASSIS SLIDES

Mount chassis slides using the following hardware. To assure unrestricted mounting of units into the adapter designated screw lengths must not be exceeded. Insert screws into designated holes and secure slide in position using the appropriate hex nuts, washers, & lockwashers.

LRA-14, -15:	CHASSIS TRAK nos.	114, 116, 118	- 10-32x5/8" fl-hd
	JONATHAN no.	130 Series	- 6-32x5/8" fl-hd
	GRANT PULLEY no.	4435 Slides	- 6-32x5/8" fl-hd
	LAMBDA SLIDE no.	KHT-34-012	- 6-32x3/8" pan-hd
LRA-16, -17:	CHASSIS TRAK no.	122	- 10-32x1/2" fl-hd
	LAMBDA SLIDE no.	KHT-44-013	- 8-32x3/8" truss-hd

INSTALLATION OF LJS-10, -13 UNITS INTO RACK ADAPTERS LRA-14 AND LRA-16

Bracket kit KT-36 is required for each LJS-10 or LJS-13 power supply to be mounted in rack adapter LRA-14 or LRA-16.

Install the LJS-10 or LJS-13 power supply into the rack adapter as follows:

1. Attach mounting brackets to the bottom of the power supply using the 6-32x3/8" pan hd. 2 pc. sems supplied with the bracket kit.

2. Position power supply and bracket assembly in the rack adapter so that the three tapped mounting holes on the bracket are aligned with the designated holes in the rack.

3. Insert three 8-32x7/16" thruss hd screws (supplied with rack adapter) from bottom of rack adapter to secure power supply and bracket in place. Terminal blocks on front mounted units face front. Terminal blocks on rear mounted units face rear.

INSTALLATION OF LN-Y, -Z AND LO-Y, -Z UNITS INTO RACK ADAPTERS LRA-14 AND LRA-16

Spacer kit KT-35 is required for each LN-Y, LN-Z, LO-Y, or LO-Z power supply to be mounted in rack adapter LRA-14 or LRA-16.

Install the LN-Y, LN-Z, LO-Y, or LO-Z power supply into the rack adapter as follows:

1. Remove cover on LN-Y or LN-Z power supply unit.

2. Attach the four spacers to the large mounting surface of the power supply using the 8-32x3/8" pan hd. 2 pc. sems supplied with the spacer kit.

3. If desired, the cover may be reinstalled on the LN-Y or LN-Z power supply.

4. Position power supply and spacer assembly in the rack adapter so that the tapped holes in the four spacers are aligned with designated holes in the rack.

5. Insert four 8-32 x 7/16" truss hd. screws (supplied with rack adapter) from bottom of rack adapter to secure power supply in place.

INSTALLATION OF POWER SUPPLY UNITS INTO RACK ADAPTERS (EXCEPT LJS-10, -13; LN-Y, -Z; LO-Y, Z INTO LRA-14, -16)

Install the power supply units into rack adapters as follows:

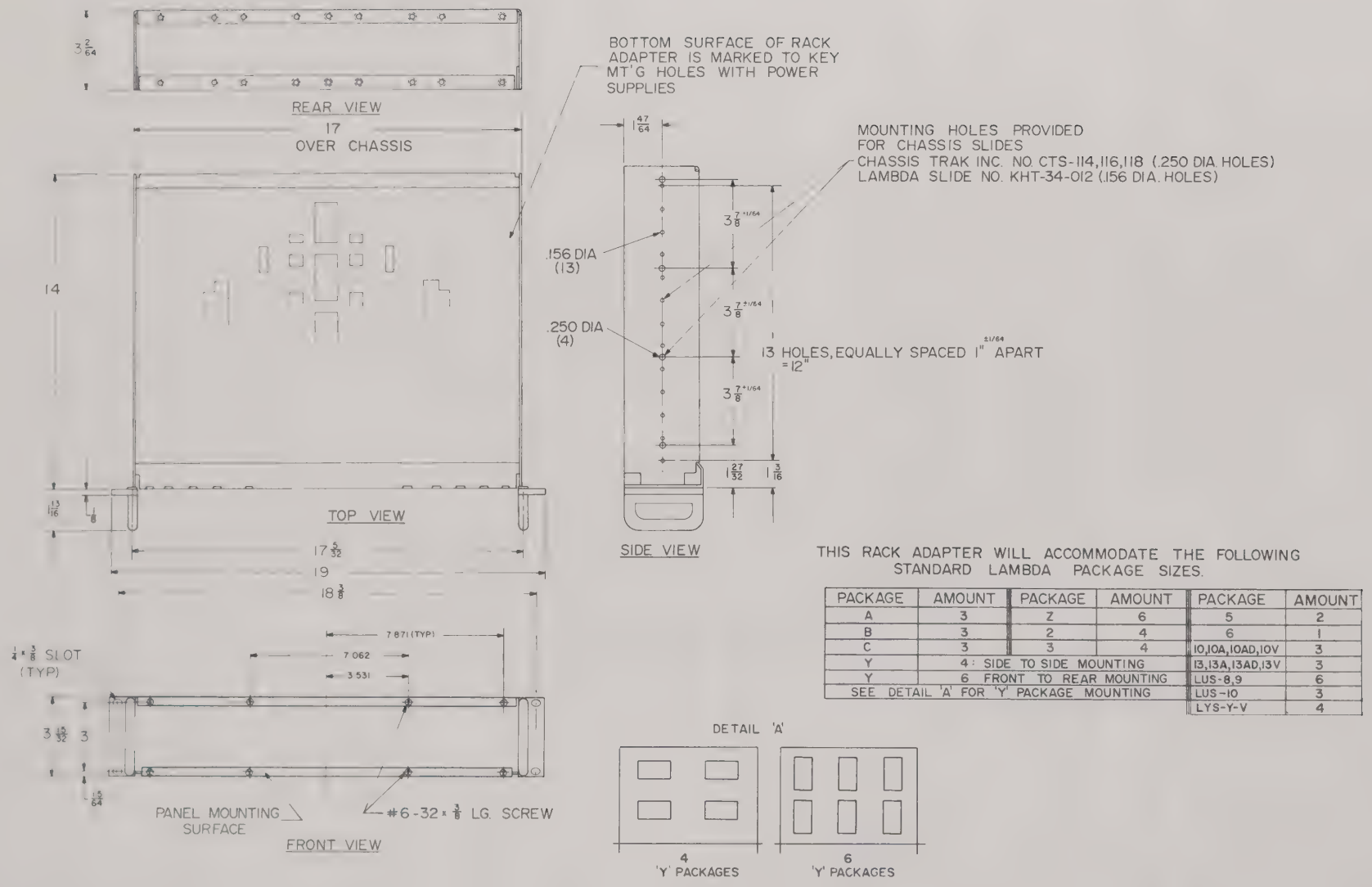
1. Position power supply unit in the rack adapter so that the tapped mounting holes on the bottom surface of the supply are aligned with designated holes in the rack.

2. Insert 6-32 x 3/8" pan hd. screws (package sizes 2, 3, 10, 11, 12, and 13), 8-32 x 3/8" truss hd. stainless steel screws (package sizes 7 and 8), or 8-32 x 7/16" truss hd. screws (all other package sizes) from bottom of rack adapter to secure power supply unit in place. Terminal blocks on front mounted units face front. Terminal blocks on rear mounted units face rear. Terminal blocks on package size 5 units face left in LRA-14 and LRA-15. Terminal blocks on package size 6 units face right in LRA-14 and left in LRA-15.

USING BLANK PANELS

Blank panels can be used to cover front opening of rack adapter. Blank panels and rack adapters that can be used together are listed below.

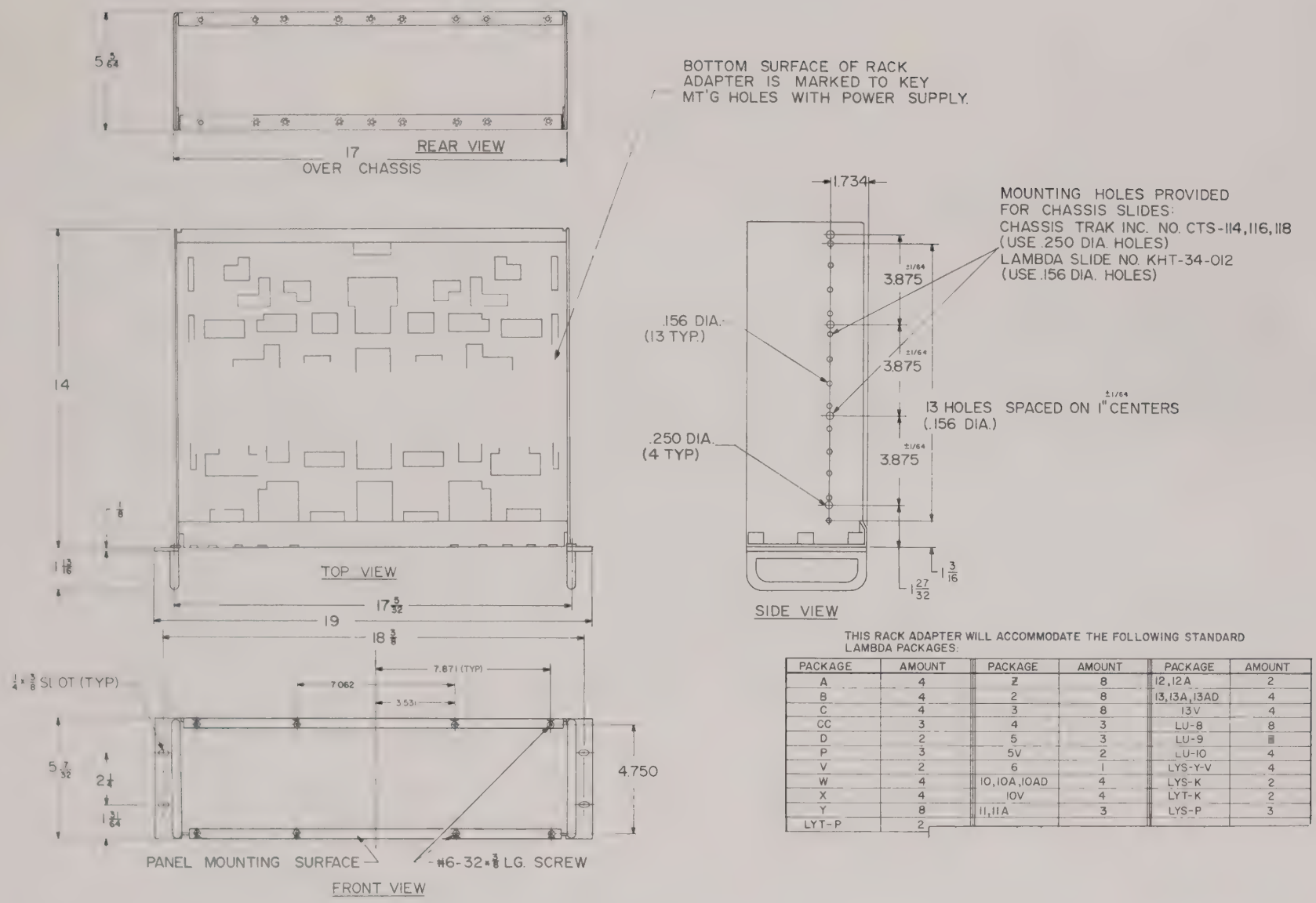
Rack Adapter	Blank Panel
LRA-14	SB-30
LRA-15	SB-50
LRA-16	SB-30
LRA-17	SB-50



THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGE SIZES.

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	3	Z	6	5	2
B	3	2	4	6	1
C	3	3	4	10,10A,10AD,10V	3
Y	4 : SIDE TO SIDE MOUNTING			13,13A,13AD,13V	3
Y	6 FRONT TO REAR MOUNTING			LUS-8,9	6
SEE DETAIL 'A' FOR 'Y' PACKAGE MOUNTING				LUS-10	3
				LYS-Y-V	4

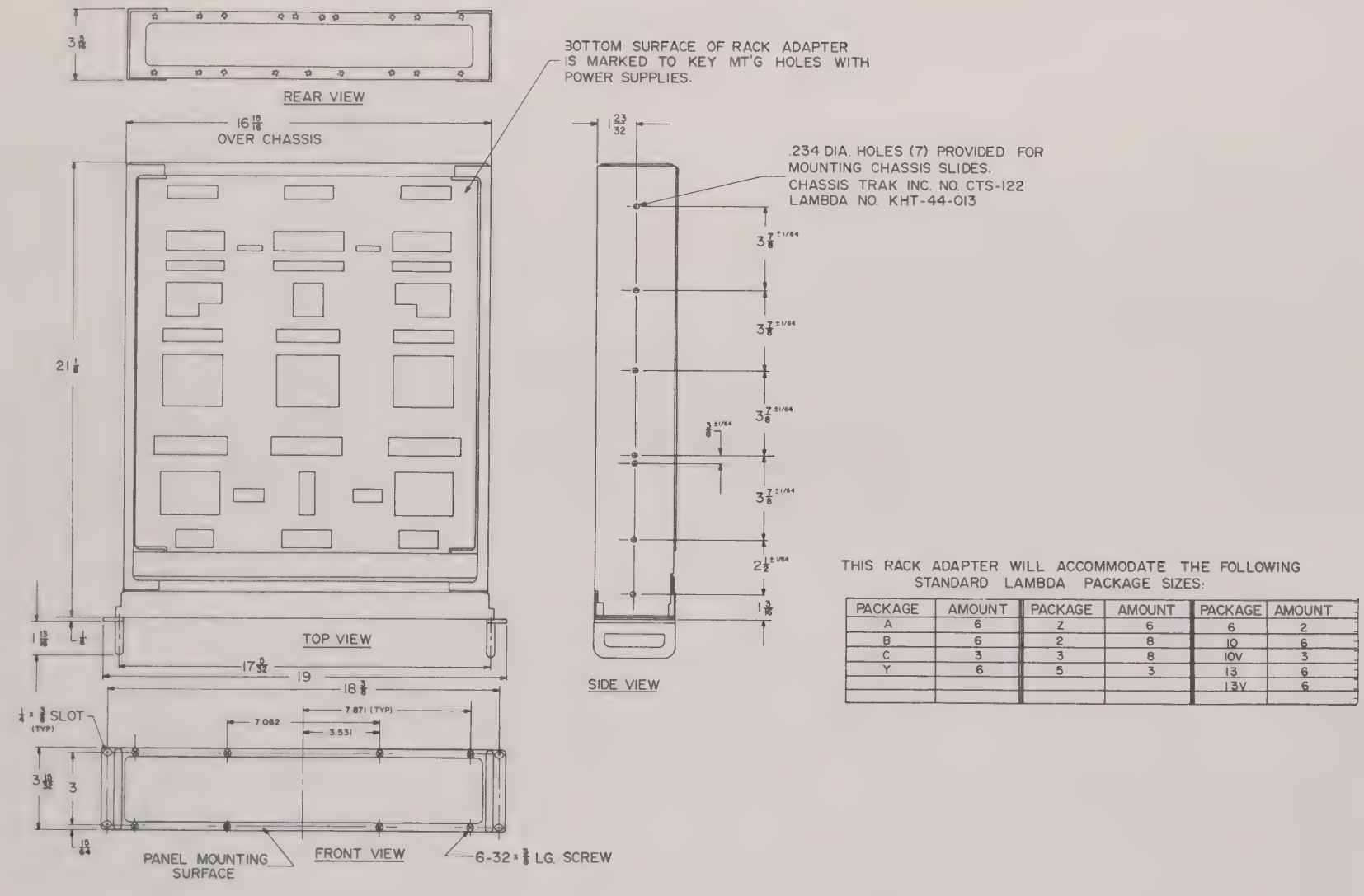
Figure 1. Outline Drawing, Rack Adapter LRA-14.



THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGES:

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	4	Z	8	12,12A	2
B	4	2	8	13,13A,13AD	4
C	4	3	8	13V	4
CC	3	4	3	LU-8	8
D	2	5	3	LU-9	8
P	3	5V	2	LU-10	4
V	2	6	1	LYS-Y-V	4
W	4	10,10A,10AD	4	LYS-K	2
X	4	10V	4	LYT-K	2
Y	8	11,11A	3	LYS-P	3
LYT-P	2				

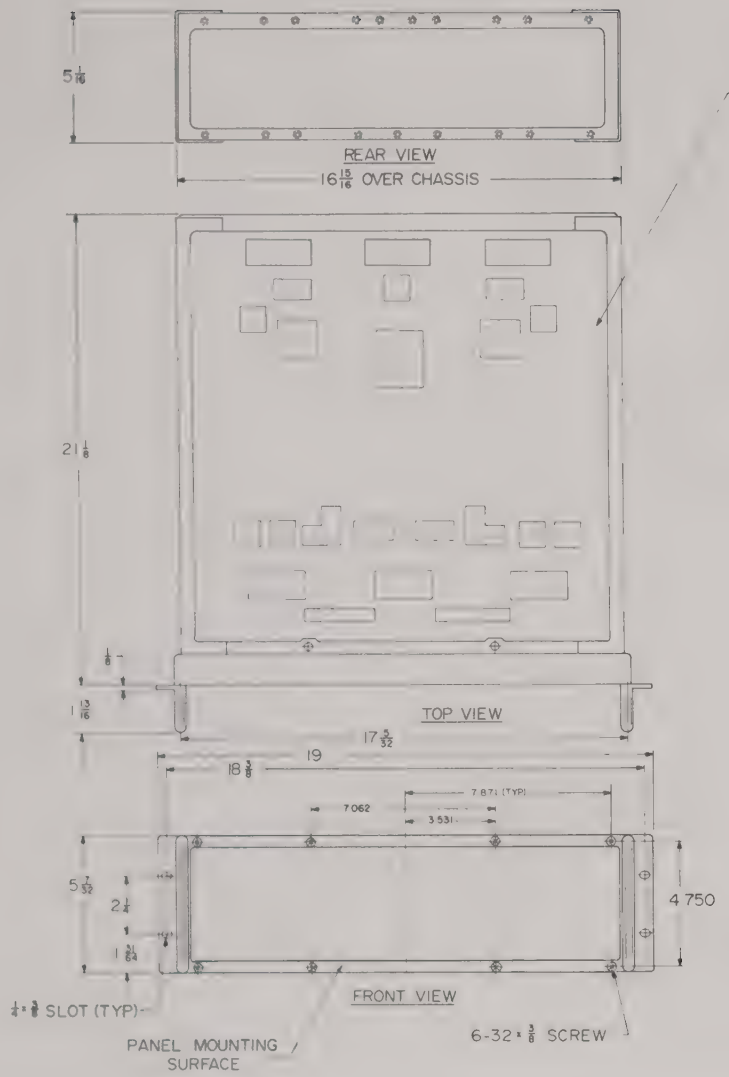
Figure 2. Outline Drawing, Rack Adapter LRA-15.


REAR VIEW
BOTTOM SURFACE OF RACK ADAPTER IS MARKED TO KEY MT'G HOLES WITH POWER SUPPLIES.
OVER CHASSIS
.234 DIA. HOLES (7) PROVIDED FOR MOUNTING CHASSIS SLIDES.
CHASSIS TRAK INC. NO. CTS-122
LAMBDA NO. KHT-44-013
TOP VIEW
SIDE VIEW
SLOT (TYP)
PANEL MOUNTING SURFACE
FRONT VIEW
6-32 x 3/8 LG. SCREW

THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGE SIZES:

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	6	Z	6	6	2
B	6	2	8	10	6
C	3	3	8	10V	3
Y	6	5	3	13	6
				13V	6

Figure 3. Outline Drawing, Rack Adapter LRA-16.



BOTTOM SURFACE OF RACK ADAPTER IS MARKED TO KEY MT'G HOLES WITH POWER SUPPLIES.

234 DIA. HOLES (7) PROVIDED FOR MOUNTING CHASSIS SLIDES LAMBDA PART NO. KHT-44-013 CHASSIS TRAK INC. CTS-122

THIS RACK ADAPTER WILL ACCOMMODATE THE FOLLOWING STANDARD LAMBDA PACKAGE SIZES

PACKAGE	AMOUNT	PACKAGE	AMOUNT	PACKAGE	AMOUNT
A	8	W	4	7	1
B	8	X	8	8	1
C	4	Y	8	10,10A,10AD	8
CC	3	Z	12	10V	4
CA	3	2	8	11,11A,11AD,11V	3
D	2	3	8	12,12A,12AD,12V	2
E	2	4	6	13,13A,13AD	8
EE	2	5	4	13V	8
P	3	5V	3	LYTP W/COVER	2
R	3	6	2	LYSK,LYTK	2
V	3	LUS-8,9,10	8	LYS-YV	8
				LYSD	2

Figure 4. Outline Drawing, Rack Adapter LRA-17.

We warrant each instrument manufactured by us, and sold by us or our authorized agents, to be free from defects in material and workmanship, and that it will perform within applicable specifications for a period of five years after original shipment. Our obligation under this guarantee is limited to repairing or replacing any instrument or part thereof, (except tubes and fuses) which shall, within five years after delivery to the original purchaser, be returned to us with transportation charges prepaid, prove after our examination to be thus defective.

We reserve the right to discontinue instruments without notice, and to make modifications in design at any time without incurring any obligation to make such modifications to instruments previously sold.

LAMBDA ELECTRONICS
515 BROAD HOLLOW ROAD • MELVILLE, L. I., NEW YORK • 516 MYRTLE 4-4200

DIVISION of Veeco INSTRUMENTS INC

6/86

INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LAMBDA

LAMBDA ELECTRONICS MELVILLE, L.I., N.Y.

INSTRUCTION MANUAL

FOR

LAMBDA

STANDARD POWER SYSTEMS II

This manual provides instructions intended for the use of Lambda Standard Power Systems II, and is not to be reproduced without the written consent of Lambda Electronics

LAMBDA ELECTRONICS MELVILLE, L.I., N.Y.

MAIN PLANT TELEPHONE: 516 MYrtle 4-4200

2/87

GENERAL DESCRIPTION

The Lambda Standard Power Systems II provides up to 4 individual power supply outputs, 9 front panel configurations, and 4 rack adapter sizes. The system may be provided with output metering, pilot light, "ON-OFF" switch as well as voltage controls for each power supply.

NOTES: 1. LN series power supplies are mounted in the system with covers installed. The current shown on the nameplate applies for use with cover removed. Refer to applicable LN series power supply instruction manual for current rating when cover is used and instructions for removing cover.

2. When any LY unit, without EMI suppression cover or accessory, is included in a power system, the output ripple and noise of *all* outputs in the power system can only be the rating of the LY unit in the system.

DC OUTPUT

Systems 1 and 2

All power supply outputs are obtained at terminals located on the power supply.

Systems 1A, 2A, 3 through 9

All power supply outputs are obtained at rear plate terminal blocks located at the rear of the rack. Each power supply has its own rear output terminal block.

A.C. INPUT — Input power is provided to the entire system at the A.C. input terminal block located at the rear of the rack.

FRONT PANEL

Systems 1 and 1A

Blank panel covers front of rack adapter.

Systems 2 and 2A

Provides an "ON-OFF" switch, pilot light, and fuse for entire system.

System 3

Provides an "ON-OFF" switch, pilot light, and fuse for entire system plus voltage adjust control for each power supply output. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152, -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

System 4

Provides "ON-OFF" switch, and fuse for entire system; voltage adjust control for each power supply output; and digital panel meter for monitoring of power supply voltage and current outputs, using a single digital panel meter and meter selection switch. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152; -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

System 5

Provides "ON-OFF" switch, and fuse for entire system; Single power supply with voltage adjust control; Digital panel meter for monitoring power supply output voltage and second panel meter for simultaneous current monitoring. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152, -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

System 6

Provides "ON-OFF" switch, and fuse for entire system; Voltage adjust controls for two power supply outputs; Single digital panel meter for each of two outputs capable of monitoring both volts and amps via panel mounted selector switch. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152; -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

System 7

Provides "ON-OFF" switch, and fuse for entire system; Voltage adjust controls for three power supply outputs; Single digital panel meter for each of three outputs capable of monitoring both volts and amps via panel mounted selector switch. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152, -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

System 8

Provides 'ON-OFF" switch, and fuse for entire system; Voltage adjust controls for two power supply outputs; Dual digital panel meters for each of two outputs capable of simultaneous monitoring of both volts and amps. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152, -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

System 9

Provides "ON-OFF" switch, and fuse for entire system; Voltage adjust controls for four power supply outputs; Single digital panel meter for each of four outputs capable of monitoring both volts and amps via panel mounted selector switch. Voltage adjust controls are not available for models LOD; LXD; LND-P-152, -W-152, -X-152, -Y-152, -Z-152; LYD-Y-152, -Y-122, -X-152, -X-122.

SYSTEMS CABLES — The systems cables provide interconnection between the power supplies, front panel, and rear terminal blocks. Refer to figures 8-12 for schematic diagrams.

SIZE

Rack Adapter LRA-14, Package "J" . . . . . 3-1/2" x 19" x 14"
Rack Adapter LRA-15, Package "K" . . . . . 5-3/16" x 19" x 14"
Rack Adapter LRA-16, Package "L" . . . . . 3-1/2" x 19" x 21-1/8"
Rack Adapter LRA-17, Package "M" . . . . . 5-3/16" x 19" x 21-1/8"

Refer to figures 2-5A for outline drawings and chassis slide accessory.

CONTROLS, INSTRUMENTS, AND FUSES (as applicable)

Systems 2 and 2A

"ON-OFF" Switch	Controls application of input power to all power supplies in the system. When switch is in the "ON" position, the red power-on indicator glows.
Pilot Light	Power-on indicator glows when ON-OFF switch is in the "ON" position.
Fuse	30 amp "SLO-BLO" fuse.

System 3

"ON-OFF" Switch	Controls application of input power to all power supplies in the system. When switch is in the "ON" position, the red power-on indicator glows.
Pilot Light	Power-on indicator glows when ON-OFF switch is in the "ON" position.
Fuse	30 amp "SLO-BLO" fuse.
Voltage Adjust Controls	Vary individual power supply output over the rated voltage range.

System 4

"ON-OFF" Switch	Controls application of input power to all power supplies in the system. When switch is in the "ON" position, digital panel meter will illuminate.
Fuse	30 amp "SLO-BLO" fuse.
Voltage Adjust Controls	Vary individual power supply output over the rated voltage range.
Digital Panel Meter	Digital meter monitors output voltage or current of the selected power supply. Display illuminates when ON-OFF switch is in the "ON" position. Display flashes when meter is overloaded. Meter accuracy is 5%, ± two counts.
Meter Selector Switch	Selects meter function. Either output voltage or current can be monitored.
Power Supply Selector Switch	Selects the desired power supply output to be monitored. Selector switch position 1 always corresponds to the left rear most power supply. Proceed sequentially from left to right in the rear row of supplies and then from left to right in the front

row to determine the correspondence of meter switch positions (4 maximum) for the remaining supplies.

Systems 5, 6, 7, 8, 9

"ON-OFF" Switch	Controls the application of input power to all power supplies in the system. When switch is in the "ON" position, digital panel meters will illuminate.
Fuse	30 amp "SLO-BLO" fuse.
Voltage Adjust Controls	Vary individual power supply output over the rated voltage range.
Digital Panel Meters	Digital Panel meters monitor individual power supply output voltage and/or current. Display illuminates when "ON-OFF" switch is in the "ON" position. Most Significant digit flashes when meter is overloaded. Meter accuracy is 5% ± two counts.
Meter Selection Switch	Selects meter function. Either output voltage or output current can be monitored. On system 5 and system 8, when individual meters are used for simultaneous monitoring of both current and voltage, meter selector switch of each meter must be in appropriate position for meter function desired.

NOTE

Refer to individual power supply instruction manual (supplied with system) for input and output specifications, and connections for operation.

CALIBRATION OF DIGITAL PANEL METER (SYSTEM 4 ONLY)

In order to ensure accuracy, the digital panel meter should be calibrated every 6 months or whenever any component part is replaced. To calibrate the meter adjust R4, R13 and R15 as follows. The adjustment procedure requires that the assembly is removed from associated equipment, is at an ambient temperature of 25-30°C and is stabilized and not operating.

1. Remove AC input power to the assembly.
2. Connect assembly for local sensing operation.
3. Apply AC input power to the assembly.
4. Place "ON-OFF" switch in "ON" position.
5. Break seal on wiper of R4.

6. Connect a digital voltmeter, Data Technology Model 40 or equivalent, plus lead to terminal TP2 and minus lead to terminal TP1. Adjust R4 until digital voltmeter reads 100 millivolts.

7. Place "METER SELECTOR" switch in the "VOLTS" position.

8.* Break seal on wiper of R13.

9.* Place power supply selector switch in position corresponding to a power supply with output voltage rating less than 10 volts. Connect digital voltmeter being used as standard to rear terminals +S and -S for the same power supply. Adjust R13 until digital panel meter reading agrees with digital voltmeter reading.

10.† Break seal on wiper of R15.

11.† Place power supply selector switch in position corresponding to a power supply with output voltage rating equal to or greater than 10 volts. Connect digital voltmeter being used as standard to rear terminals +S and -S for the same power supply. Adjust R15 until digital panel meter reading agrees with digital voltmeter reading.

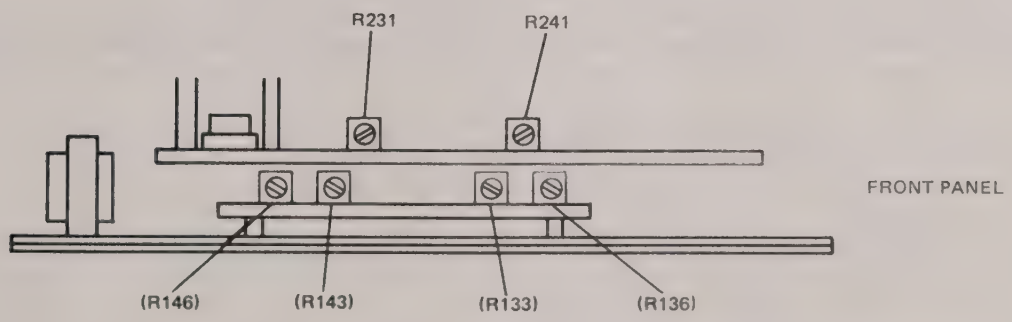
12. After adjustment is completed remove AC input power to the assembly and use glyptol sealant to seal wipers of R4, R13, and R15 to resistor housing.

13. After sealing, check settings and repeat adjustment procedure if required.

CALIBRATION OF DIGITAL PANEL METERS (SYSTEM 5, 6, 7, 8, 9)

Location of Calibration Controls

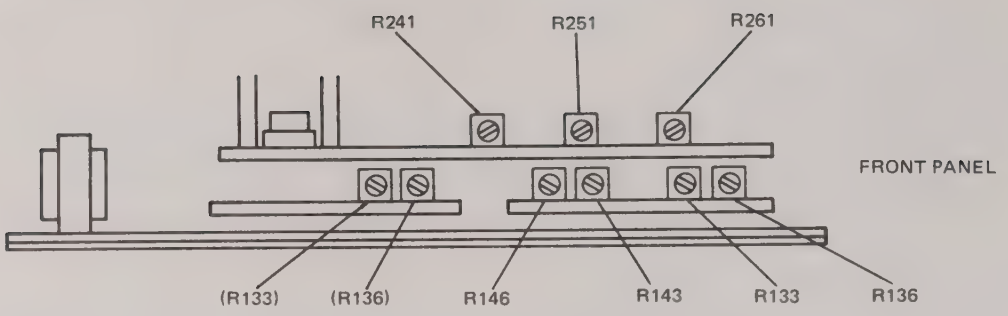
System 5, 6:



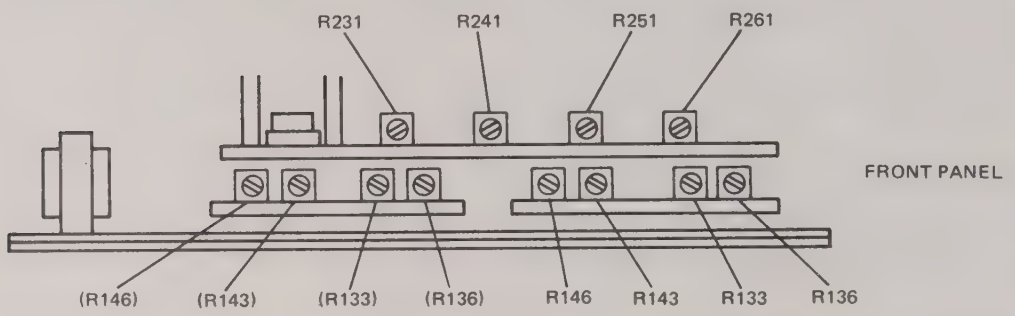
* Omit steps 8 and 9 if all power supplies in assembly have output voltage rating equal to or greater than 10 volts.

† Omit steps 10 and 11 if all power supplies in assembly have output voltage rating less than 10 volts.

System 7:



System 8, 9:



In order to ensure accuracy, the digital panel meter should be calibrated every 6 months or whenever any component part is replaced. The adjustment procedure requires that the assembly is removed from associated equipment, is at an ambient temperature of 25-30° C and is stabilized and not operating. (In the following procedure the digital panel meter to the left most side of the front panel is always designated M1 and all meters to the right of this are sequentially designated M2, M3 . . . as required).

1. Remove AC input power to the assembly.
2. Connect assembly for local sensing operation.
3. Apply AC input power to the assembly.
4. Place "ON-OFF" switch in "ON" position.

(For System 5 and System 8, perform steps 5 through 11. For System 6, 7 and 9, go to step 12.)

5. Break seal on wiper of (R146) for M1 (and where applicable, R146 for M3).
6. Connect a digital voltmeter, Data Technology Model 40 or equivalent, to output #1 +S and -S terminals. With M1 "METER SELECTION" switch in "VOLTS" position, adjust (R146) until reading of M1 corresponds to reference meter reading. Seal wiper of (R146) with glyptol sealant and recheck reading. Repeat procedure if required.

7. Repeat step 6 for output #2 and M3 (with R146) if applicable.

8. Break seals on wipers of (R133) and R241 for M2 (and where applicable, R133 and R261 for M4).

9. With output #1 at no load, adjust R241 until M2, with "METER SELECTION" switch in "AMPS" position, reads 0.01 (or, where applicable, 00.1 or 001). Turn R241 CCW until meter just reads 0. Seal R241 with glyptol sealant.

10. Connect a current measuring device and known load in series with output #1. Adjust (R133) until reading on M2 corresponds with that of reference meter. Seal (R133) with glyptol sealant and recheck reading. Repeat procedure if required.

11. Repeat steps 9 and 10 for output #2 and M4 (with R261 and R133) if applicable.

(Steps 12 through 19 apply to System 6, 7 and 9).

12. Break seal or wiper of (R146) and (R136) for system 6. (For system 7, break seal on wiper of (R136), R146 and R136; For system 9, break seal on wiper of R(146) (R136), R146, R136).

13. Apply a digital voltmeter, Data Technology Model 40 or equivalent, to output #1 +S and -S terminals. With M1 "METER SELECTION" switch in "VOLTS" position, adjust (R146) ((R136 on system 7 only) until reading of M1 corresponds to reference meter reading. Seal wiper of (R146) (or where applicable, (R136)) with glyptol sealant and recheck reading. Repeat procedure if required.

14. Repeat step 13 for output #2 and M2 (with (R136) or, on system 7 only, R146); and where applicable, output #3 and M3 (with R146 or, on system 7 only, R136) and output #4 and M4 (with R136).

15. Break seals on wipers of (R143), (R133), R231 and R241 for system 6. (For system 7, break seals on wipers of (R133), R143, R133, R241, R251 and R261 for system 9 break seals on wipers of (R143), (R133), R143, R133, R231, R241, R251 and R261).

16. With output #1 at no load, adjust R231 (or, on system 7 only, R241) until M1, with "METER SELECTION" switch in "AMPS" position, reads 0.01 (or, where applicable, 00.1 or 001). Turn R231 (or, where applicable, R241) CCW until meter just reads 0. Seal wiper with glyptol sealant.

17. Repeat step 16 for output #2 and M2 (with R241 or, on system 7 only, R251); and where applicable, output #3 and M3 (with R251 or, on system 7 only, R261) and output #4 and M4 (with R261).

18. Connect a current measuring device and known load in series with output #1. Adjust (R143) (or, on system 7 only, (R133)) until reading of M1 corresponds to reference meter reading. Seal wiper of (R143) (or, where applicable, (R133)) with glyptol sealant and recheck reading. Repeat procedure if necessary.

19. Repeat step 18 for output #2 and M2 (with (R133) or, on system 7 only, R143) and where applicable, output #3 and M3 (with R143 or, on system 7 only, R133) and output #4 and M4 (with R133).

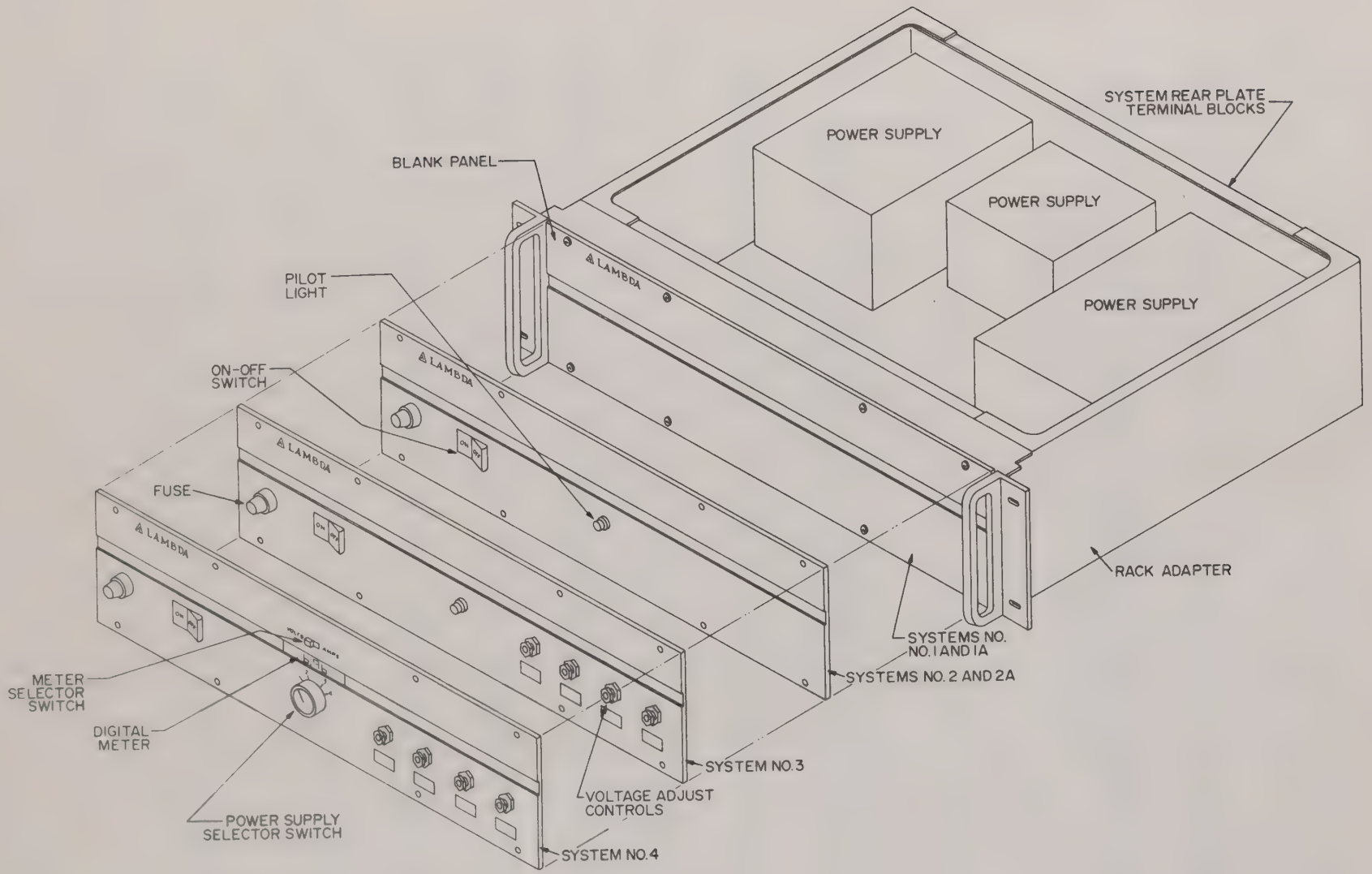


Figure 1. Systems Configurations, Systems 1 through 4.

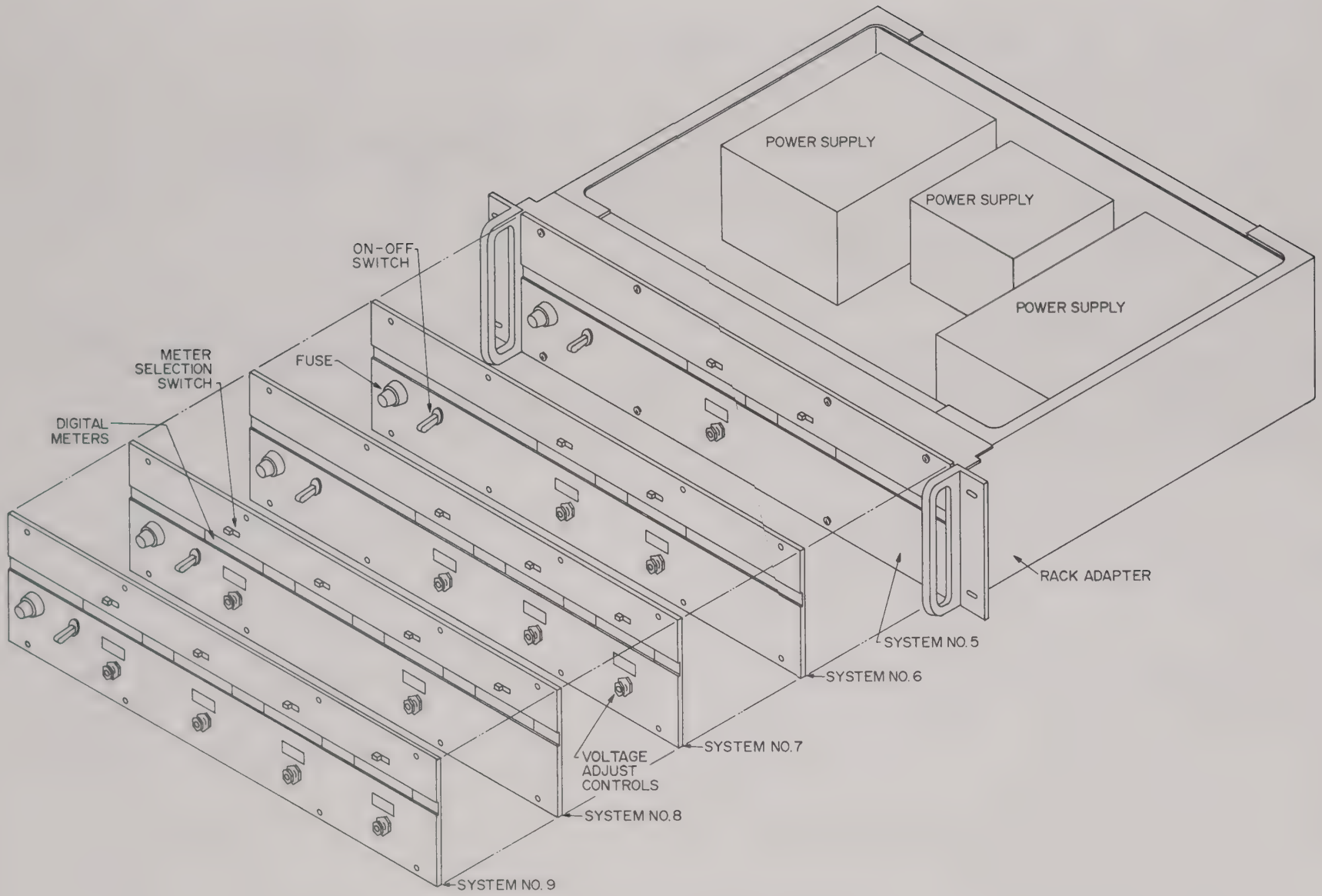
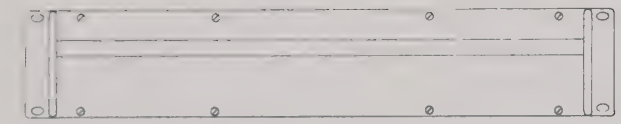
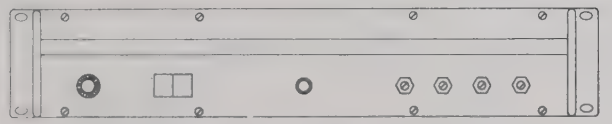


Figure 1A. Systems Configurations, Systems 5 through 9.

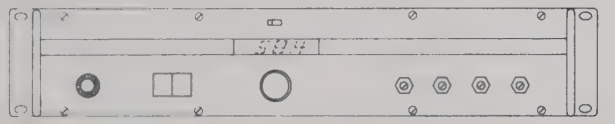


SYSTEM 1 8 ,SB-30, BLANK PANEL

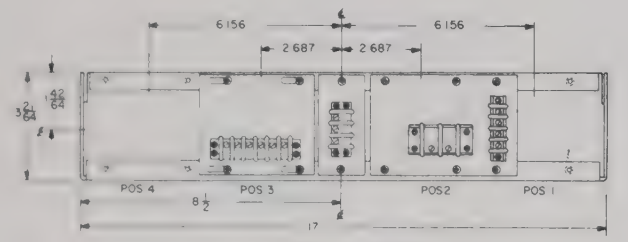
SYSTEM 2 8 SBS-30, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT



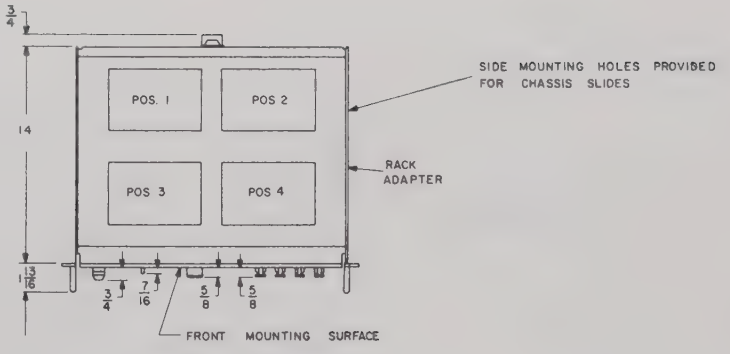
SYSTEM 3, PCP-30-1 thru 4, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS)



SYSTEM 4, SMP-30-1 thru 4, PANEL WITH ON-OFF SWITCH, AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS) (PLUS METERING UP TO 4 SUPPLIES)

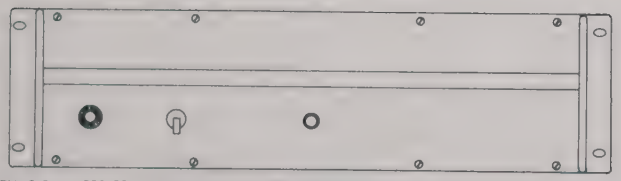


TYPICAL REAR VIEW

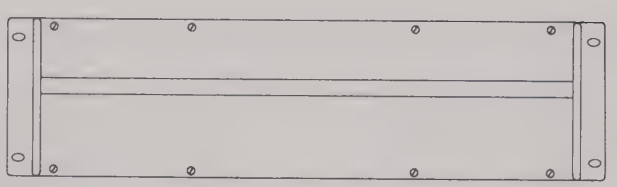


POWER SUPPLY POSITIONS

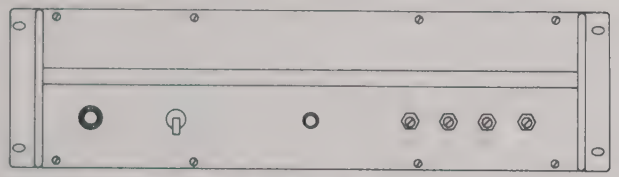
Figure 2. Outline Drawing, LRA-14 (Package "J") Standard Power System.



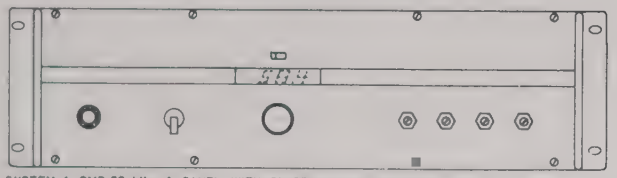
SYSTEM 2 & SBS-50, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT



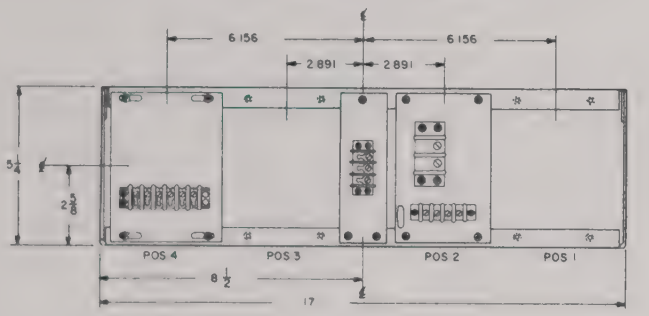
SYSTEM 1 & SB-50, BLANK PANEL



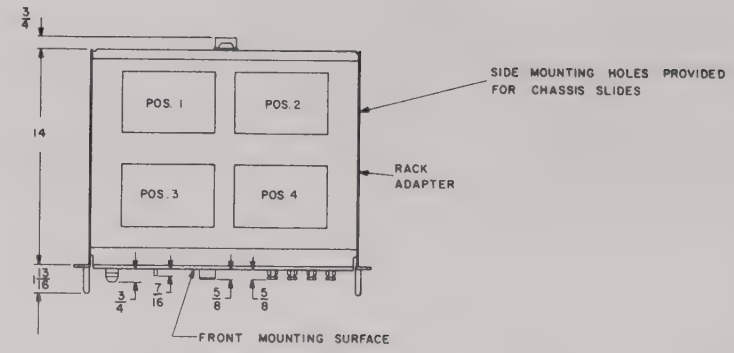
SYSTEM 3, PCP-50-1 thru 4, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS)



SYSTEM 4, SMP-50-1 thru 4, PANEL WITH ON-OFF SWITCH, AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS) (PLUS METERING UP TO 4 SUPPLIES)

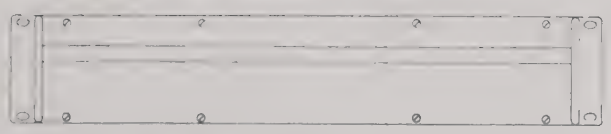


TYPICAL REAR VIEW



POWER SUPPLY POSITIONS

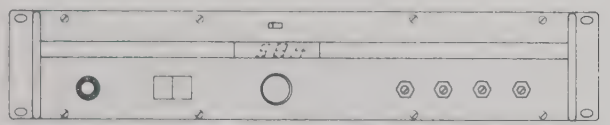
Figure 3. Outline Drawing, LRA-15 (Package "K") Standard Power System.



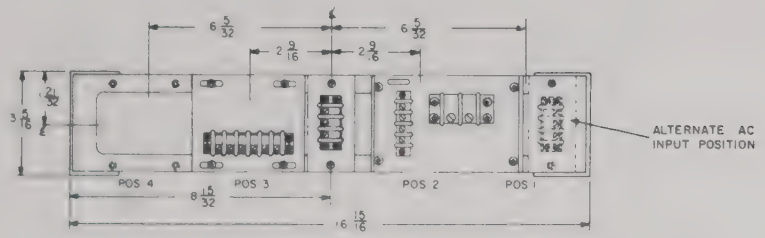
SYSTEM 1 & 1A, SB-30 BLANK PANEL

SYSTEM 2 & 2A, SBS-30, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT

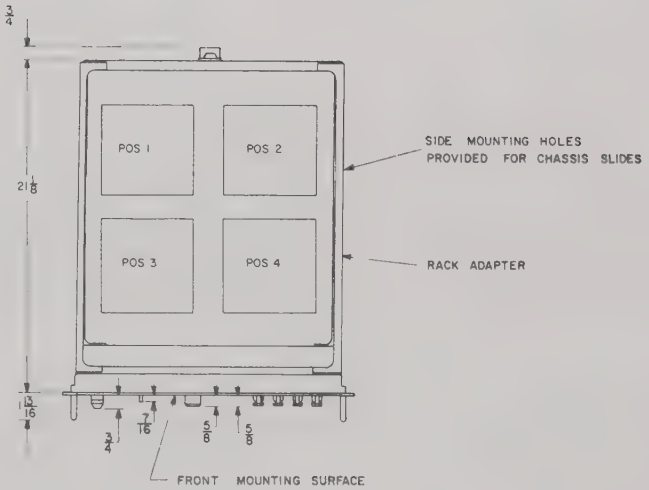
SYSTEM 3, PCP-30-1 thru 4, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS)



SYSTEM 4, SMP-30-1 thru 4, PANEL WITH ON-OFF SWITCH, AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS) (PLUS METERING UP TO 4 SUPPLIES)

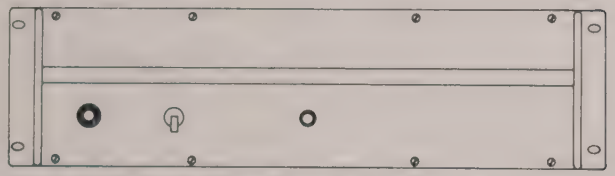


REAR VIEW TYPICAL

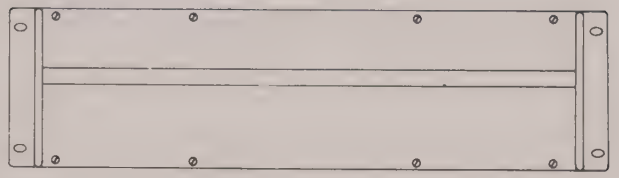


POWER SUPPLY POSITIONS

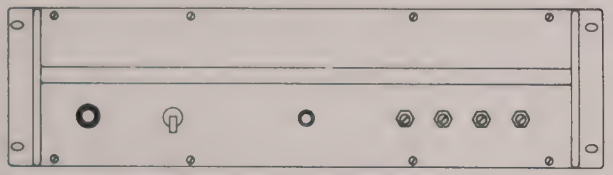
Figure 4. Outline Drawing, LRA-16 (Package "L") Standard Power System.



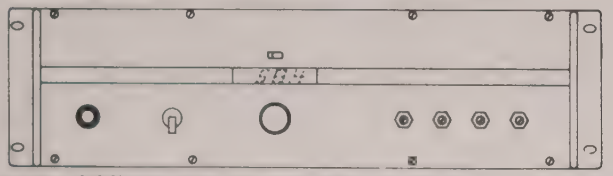
SYSTEMS 2 & 2A, SBS-50, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT.



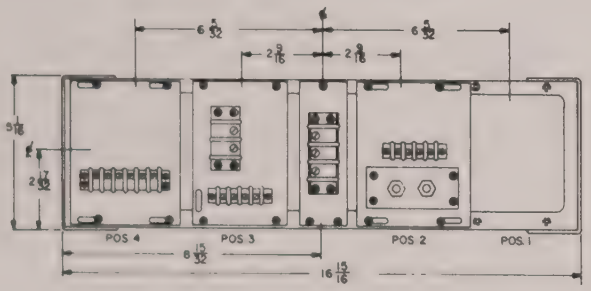
SYSTEMS 1 AND 1A, SB-50, BLANK PANEL



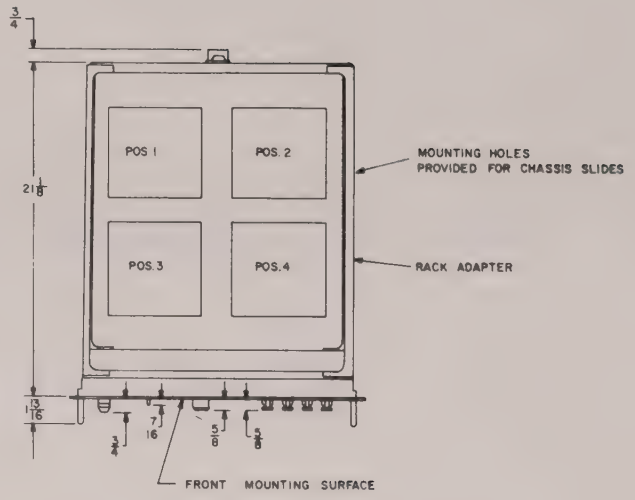
SYSTEM 3, PCP-50-1 thru 4, PANEL WITH ON-OFF SWITCH, PILOT LIGHT AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS)



SYSTEM 4, SMP-50-1 thru 4, PANEL WITH ON-OFF SWITCH, AND FUSE FOR AC INPUT PLUS UP TO 4 VOLTAGE CONTROLS (POTENTIOMETERS) (PLUS METERING UP TO 4 SUPPLIES)

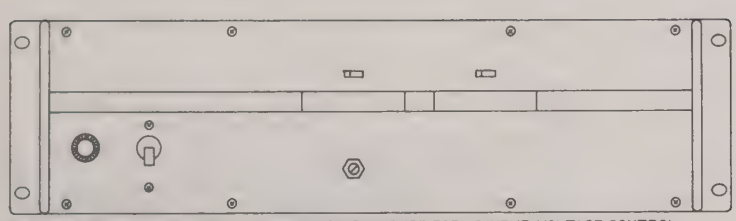


REAR VIEW TYPICAL

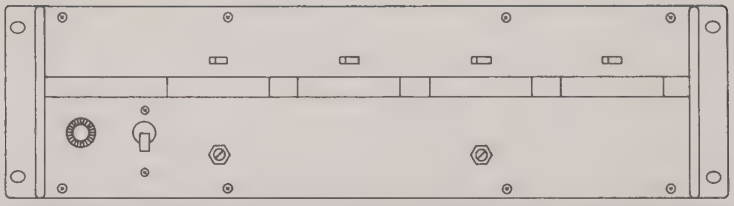


POWER SUPPLY POSITIONS

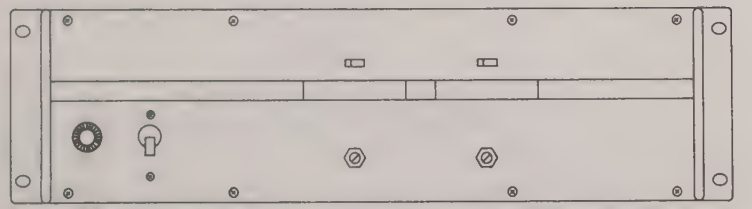
Figure 5. Outline Drawing, LRA-17 (Package "M") Standard Power System



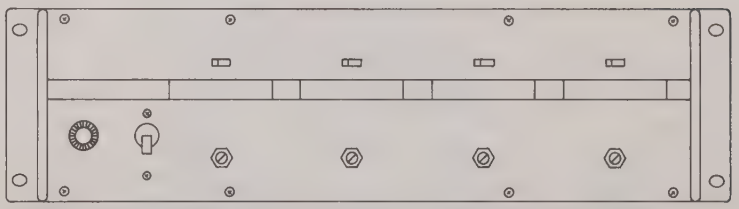
SYSTEM 5, DPM-50-2 PANEL WITH ON-OFF SWITCH, FUSE FOR AC INPUT, VOLTAGE CONTROL, TWO DIGITAL PANEL METERS.



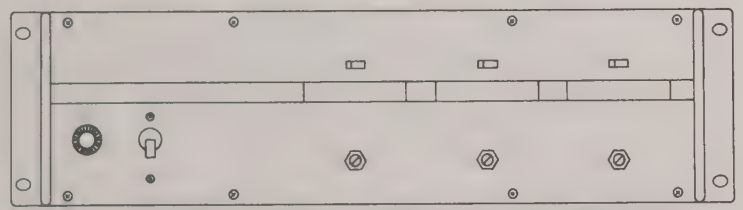
SYSTEM 8, DPM-50-4 PANEL WITH ON-OFF SWITCH, FUSE FOR AC INPUT, TWO VOLTAGE CONTROLS, FOUR DIGITAL PANEL METERS, FOUR METER SELECTION SWITCHES.



SYSTEM 6, DPM-50-2 PANEL WITH ON-OFF SWITCH, FUSE FOR AC INPUT, TWO VOLTAGE CONTROLS, TWO METER SELECTION SWITCHES, TWO DIGITAL PANEL METERS.



SYSTEM 9, DPM-50-4 PANEL WITH ON-OFF SWITCH, FUSE FOR AC INPUT, FOUR VOLTAGE CONTROLS, FOUR METER SELECTION SWITCHES, FOUR DIGITAL PANEL METERS.



SYSTEM 7, DPM-50-3 PANEL WITH ON-OFF SWITCH, FUSE FOR AC INPUT, THREE VOLTAGE CONTROLS, THREE METER SELECTION SWITCHES, THREE DIGITAL PANEL METERS.

Figure 5A. Outline Drawing, Systems 5 through 9 Panel Configurations for LRA-15 (Package "K") and LRA-17 (Package "M") Standard Power Systems

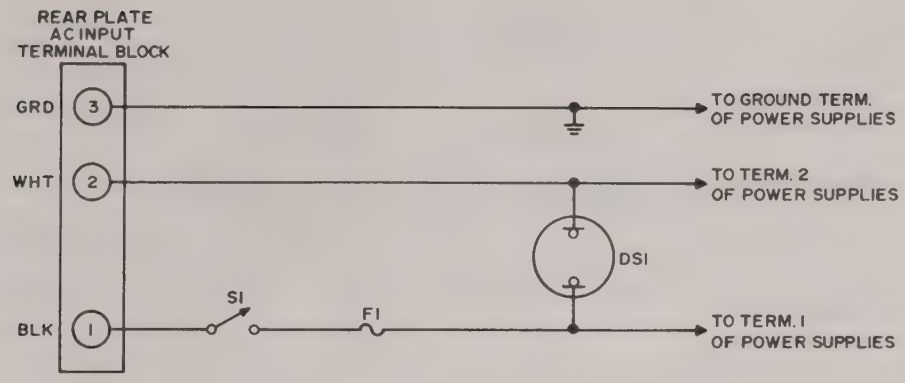


Figure 6. Schematic Diagram, AC Input Power Control for Systems 2, 2A, and 3.

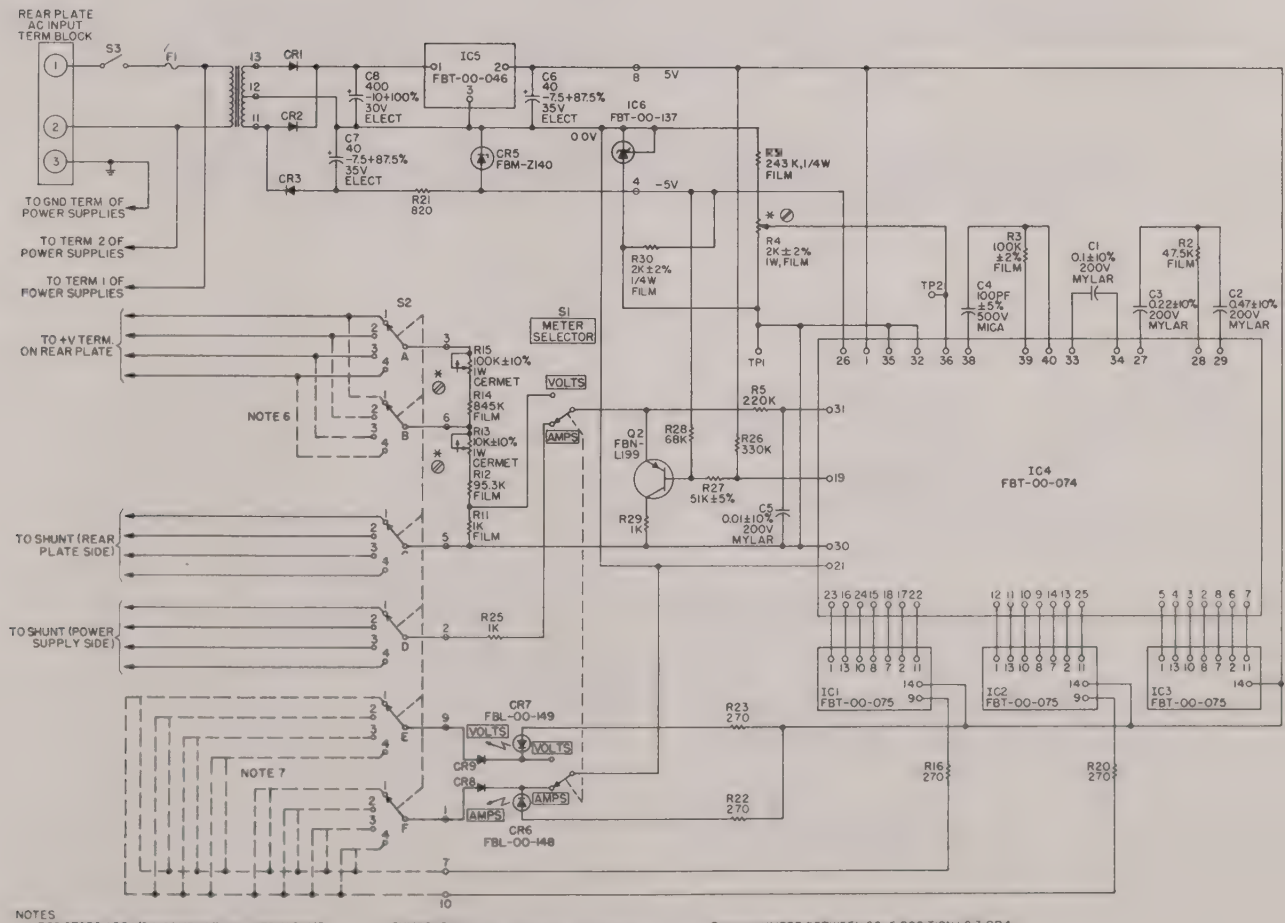


Figure 7. Schematic Diagram, AC Input Control and Digital Panel Meter for System 4.

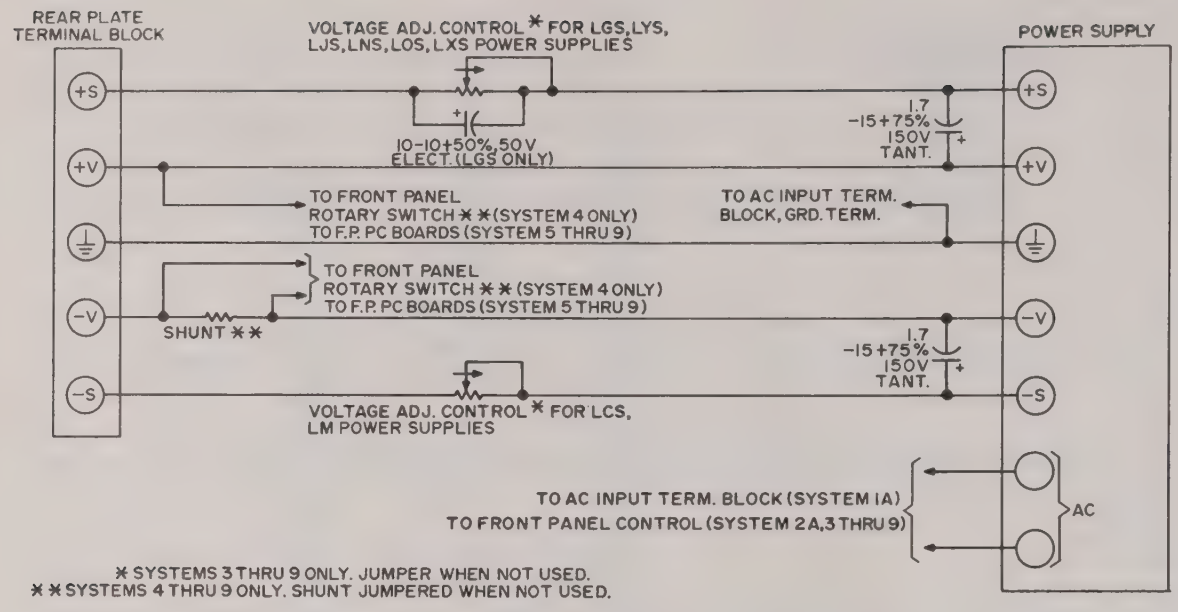


Figure 8. Schematic Diagram, DC Output for LCS, LGS, LJS, LM, LNS, LOS, LXS and LYS Power Supplies with Output Current Rating Less Than 14.5 Amps (Systems 1A, 2A and 3 through 9)

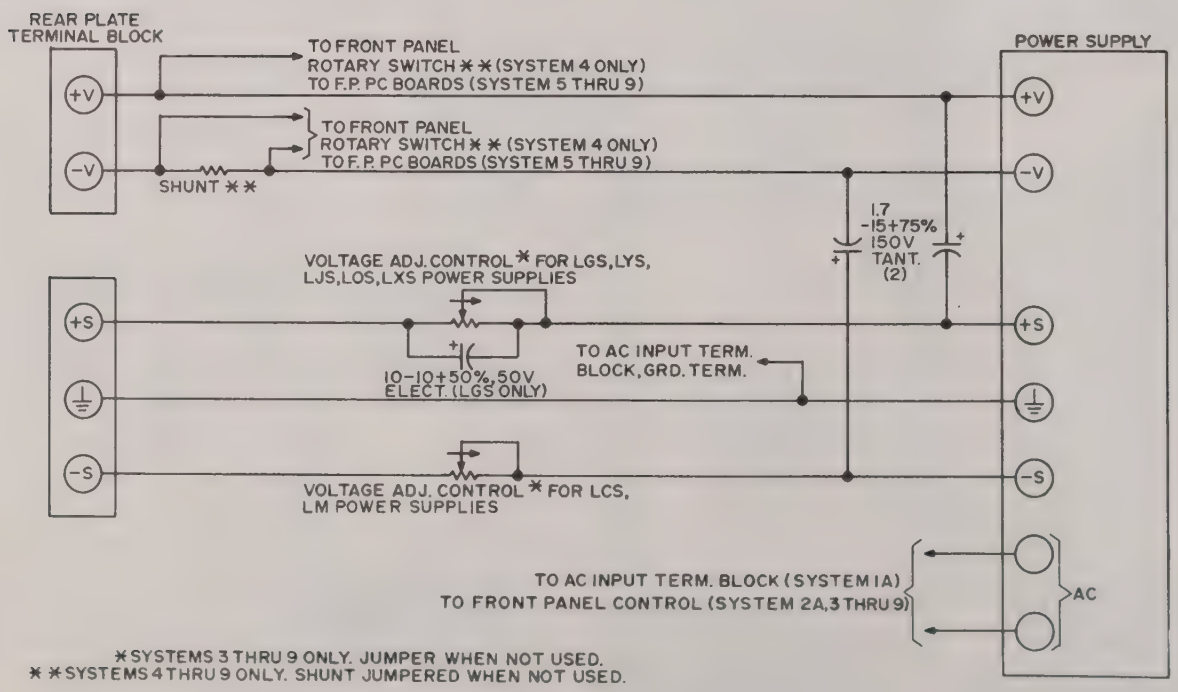


Figure 9. Schematic Diagram, DC Output for LCS, LGS, LJS, LM, LNS, LOS, LXS and LYS Power Supplies with Output Current Rating between 14.5 Amps and 50 Amps (Systems 1A, 2A and 3 through 9).

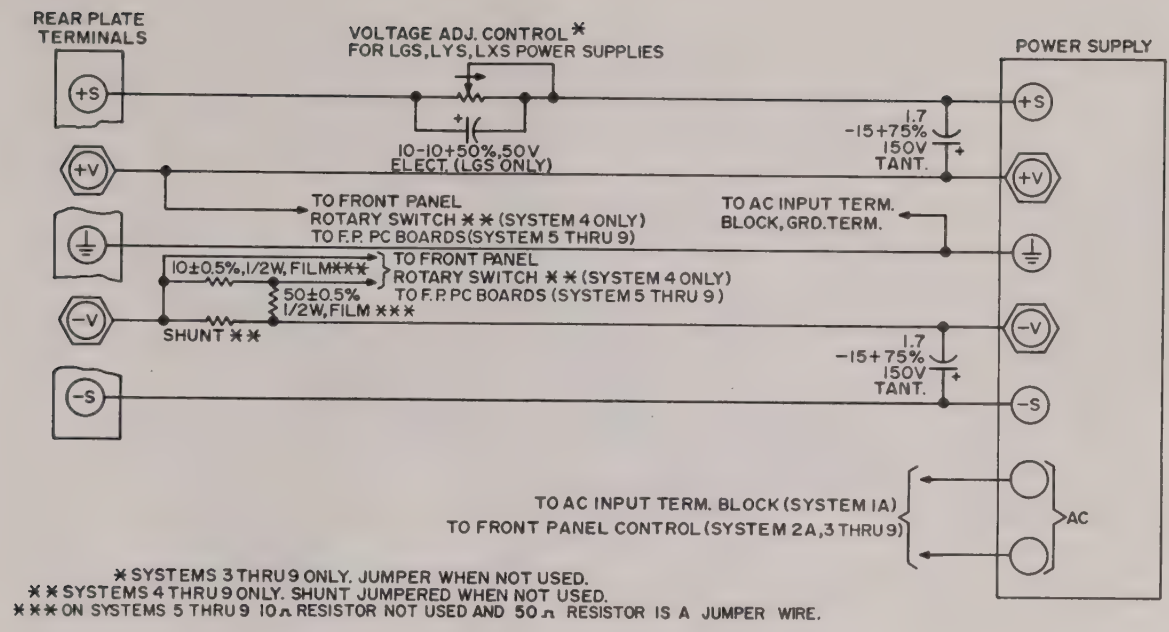

REAR PLATE TERMINALS
VOLTAGE ADJ. CONTROL *
FOR LGS, LYS, LXS POWER SUPPLIES
POWER SUPPLY
+S
+V
10-10+50%, 50V ELECT. (LGS ONLY)
1.7 -15+75% 150V TANT.
TO FRONT PANEL ROTARY SWITCH * * (SYSTEM 4 ONLY) TO F.P. PC BOARDS (SYSTEM 5 THRU 9)
TO AC INPUT TERM. BLOCK, GRD. TERM.
10±0.5%, 1/2W, FILM***
50±0.5% 1/2W, FILM ***
TO FRONT PANEL ROTARY SWITCH * * (SYSTEM 4 ONLY) TO F.P. PC BOARDS (SYSTEM 5 THRU 9)
-V
SHUNT * *
-S
TO AC INPUT TERM. BLOCK (SYSTEM 1A)
TO FRONT PANEL CONTROL (SYSTEM 2A, 3 THRU 9)
AC
* SYSTEMS 3 THRU 9 ONLY. JUMPER WHEN NOT USED.
* * SYSTEMS 4 THRU 9 ONLY. SHUNT JUMPERED WHEN NOT USED.
* * * ON SYSTEMS 5 THRU 9 10Ω RESISTOR NOT USED AND 50Ω RESISTOR IS A JUMPER WIRE.

Figure 10. Schematic Diagram, DC Output for LGS, LXS and LYS Power Supplies with Output Current Rating of 50 Amps or Higher (Systems 1A, 2A and 3 through 9).

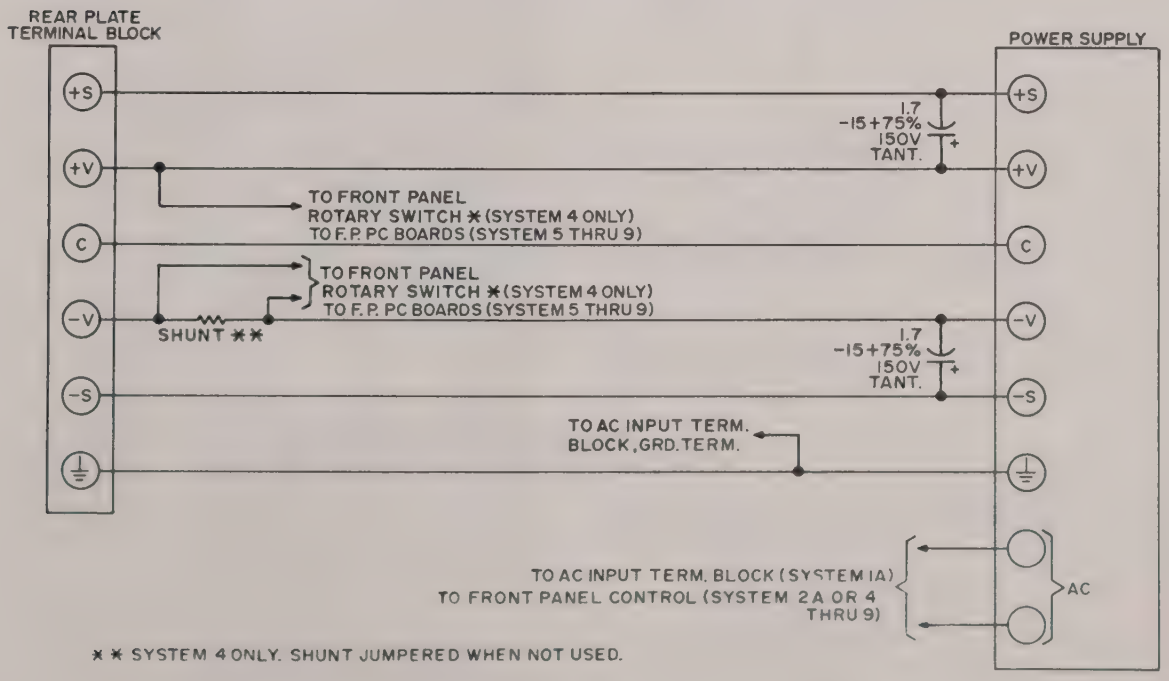

REAR PLATE TERMINAL BLOCK
POWER SUPPLY
+S
+V
C
-V
-S
1.7 -15+75% 150V TANT.
TO FRONT PANEL ROTARY SWITCH * (SYSTEM 4 ONLY) TO F.P. PC BOARDS (SYSTEM 5 THRU 9)
TO FRONT PANEL ROTARY SWITCH * (SYSTEM 4 ONLY) TO F.P. PC BOARDS (SYSTEM 5 THRU 9)
SHUNT * *
TO AC INPUT TERM. BLOCK, GRD. TERM.
TO AC INPUT TERM. BLOCK (SYSTEM 1A)
TO FRONT PANEL CONTROL (SYSTEM 2A OR 4 THRU 9)
AC
* * SYSTEM 4 ONLY. SHUNT JUMPERED WHEN NOT USED.

Figure 11. Schematic Diagram: DC Output for LND-P-152, W-152, -X-152, -Y-152, -Z-152; LOD; LXD; and LYD-Y-152, -Y-122, -X-152, -X-122 Power Supplies (Systems 1A, 2A and 4 through 9).

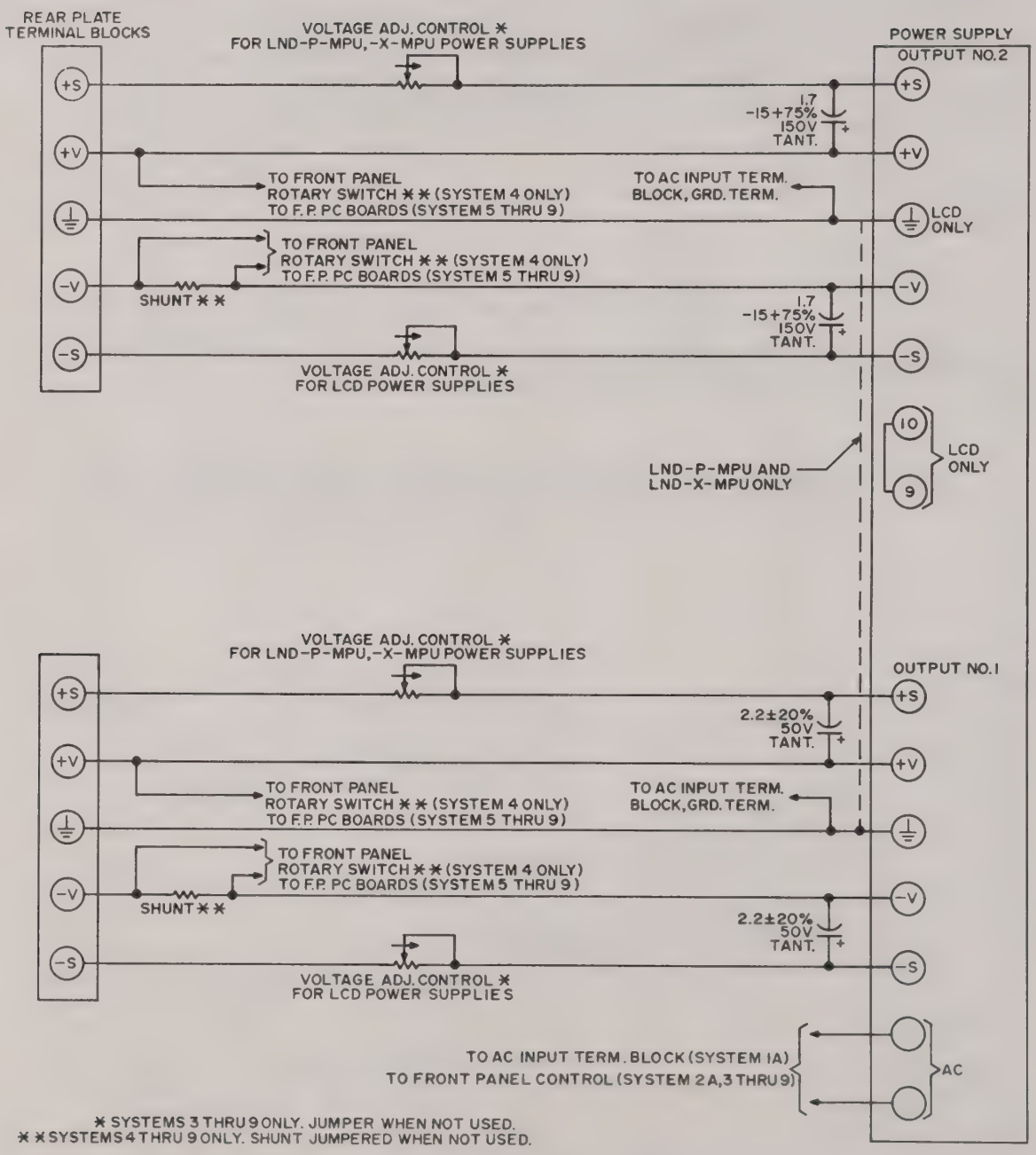


Figure 12. Schematic Diagram: DC Output for LCD; LND-P-MPU, -X-MPU Power Supplies (Systems 1A, 2A and 3 through 9).

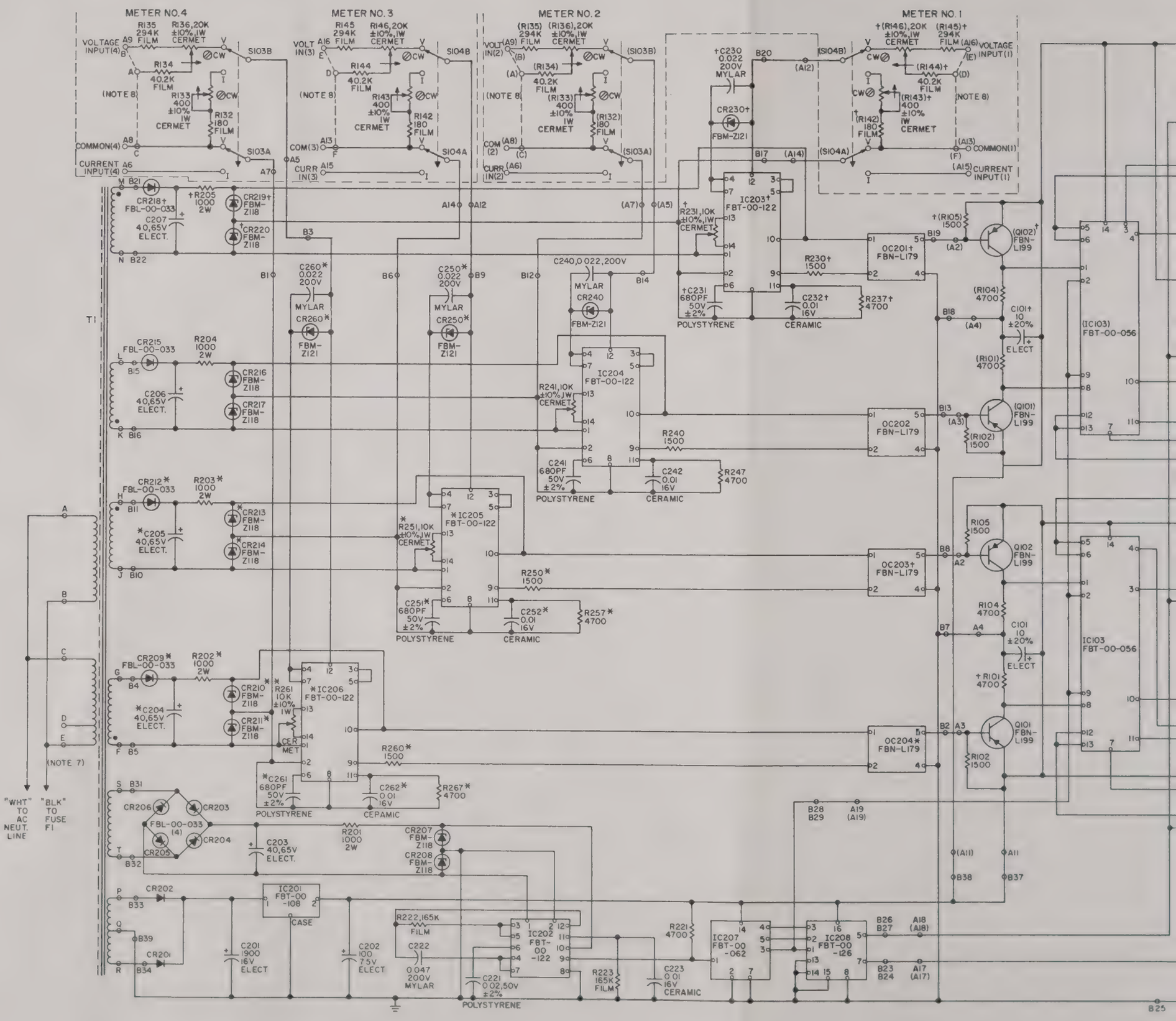
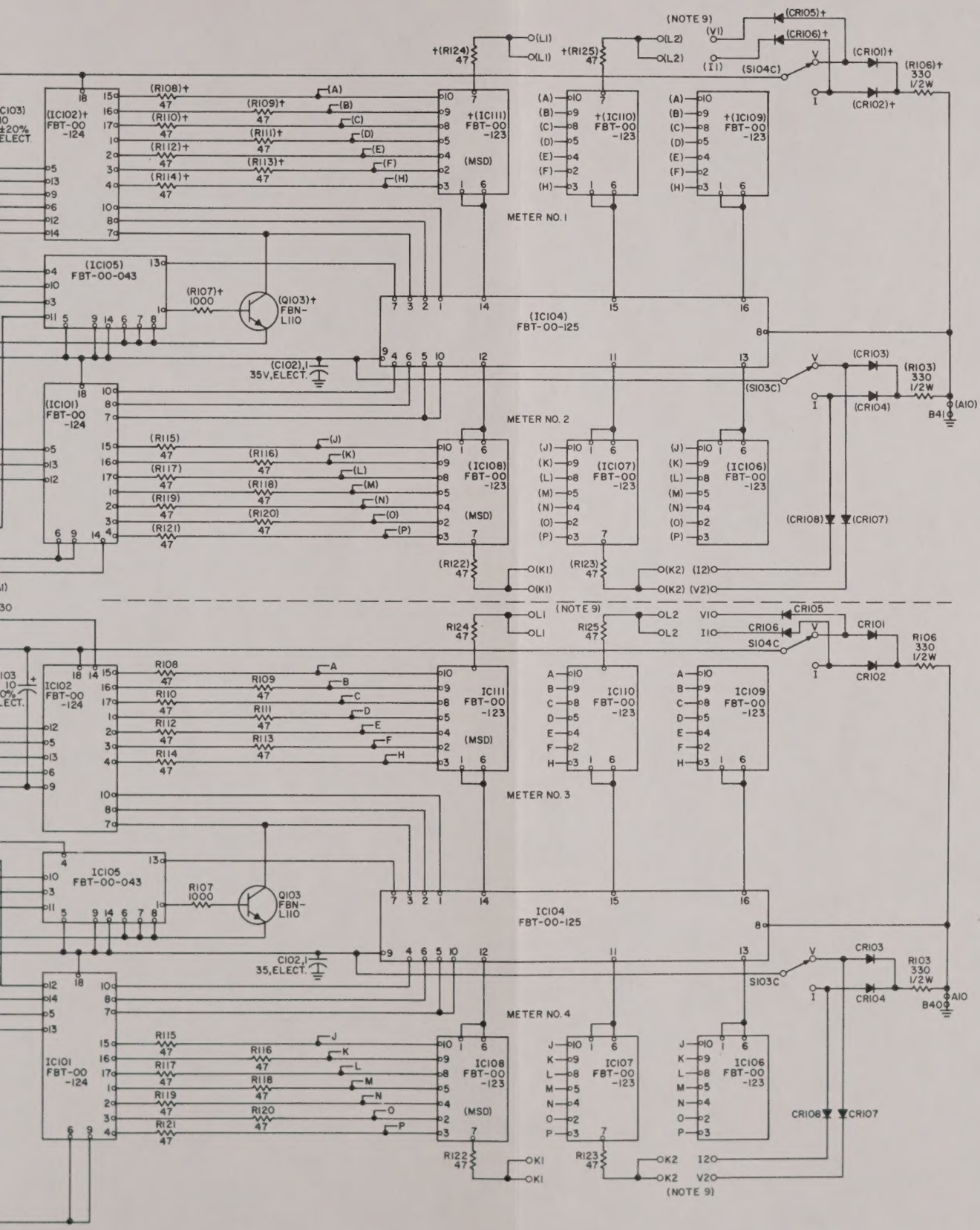
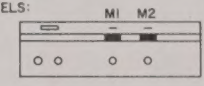


Figure 13. Schematic Diagram, AC Input

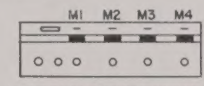


NOTES

1. COMPONENTS WITH DESIGNATIONS IN PARENTHESES, "(100)" ARE ON PC BD. A1; DESIGNATIONS WITHOUT PARENTHESES, "100", ARE ON PC BD. A2.
2. RESISTORS ARE 1/4W COMP. WITH VALUES IN OHMS UNLESS OTHERWISE NOTED.
3. CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.
4. RESISTOR TOLERANCES: COMP. ±10%, FILM ±1%.
5. CAPACITOR TOLERANCES: ELECTROLYTIC −10+100%, CERAMIC ±20%, MYLAR ±10%.
6. SYMBOLS:
   - ▭ INDICATES ACTUAL UNIT MARKING.
   - ↓ INDICATES CLOCKWISE ROTATION OF SHAFT.
   - * SEE INSTRUCTION MANUAL.
   - ⊣⊢ LAMBDA PART NO. FBL-00-030.
7. INPUT WIRING SHOWN IS FOR 105-132 VAC, 47-63 Hz INPUT.
   FOR 205-265 VAC, 47-63 Hz INPUT, DISCONNECT A FROM C AND B FROM E; CONNECT B TO C, INPUT NOW IS ACROSS A AND E.
   FOR 187-242 VAC, 47-63 Hz INPUT, DISCONNECT A FROM C AND B FROM E; CONNECT B TO C, INPUT IS NOW ACROSS A AND D.
8. METER VOLTAGE SELECT:
   FOR 0 TO 9.99V JUMPER A TO B OR D TO E OR (A) TO (B) OR (D) TO (E)
   FOR 0 TO 99.9V JUMPER A TO C OR D TO F OR (A) TO (C) OR (D) TO (F).
9. DECIMAL POINT SELECT:
   FOR 0 TO 9.99V JUMPER (V1) TO (L1) FOR M1 OR (V2) TO (K1) FOR M2 OR V1 TO L1 FOR M3 OR V2 TO K1 FOR M4.
   FOR 0 TO 99.9V JUMPER (V1) TO (L2) FOR M1 OR (V2) TO (K2) FOR M2 OR V1 TO L2 FOR M3 OR V2 TO K2 FOR M4.
   FOR 0 TO 9.99A JUMPER (I1) TO (L1) FOR M1 OR (I2) TO (K1) FOR M2 OR I1 TO L1 FOR M3 OR I2 TO K1 FOR M4.
   FOR 0 TO 99.9A JUMPER (I1) TO (L2) FOR M1 OR (I2) TO (K2) FOR M2 OR I1 TO L2 FOR M3 OR I2 TO K2 FOR M4.
10. METER IDENTIFICATION:
    ON 2 METER PANELS:



ON 3 OR 4 METER PANELS:

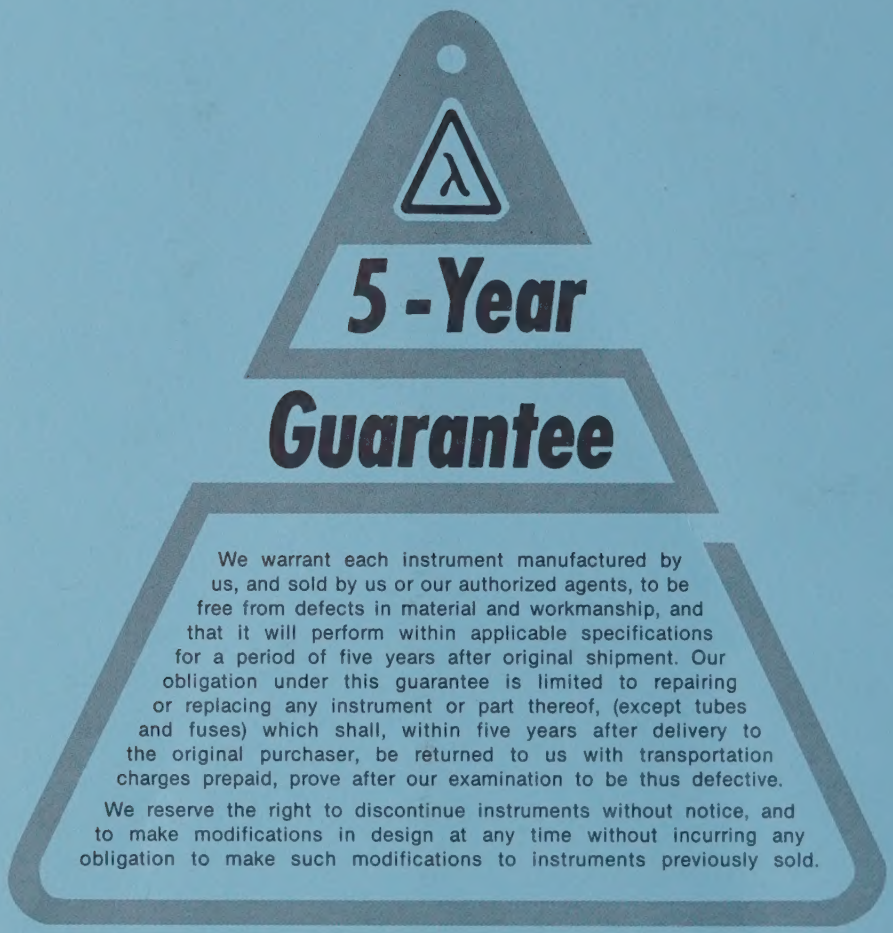


(ON 3 METER PANELS ONLY M2, M3 AND M4 ARE USED)

ON 2 METER PANELS: OMIT ALL PARTS WITH 100 DESIGNATION NOT IN PARENTHESES, ALSO ALL PARTS WITH 200 DESIGNATION WITH AN *.
ON 3 METER PANELS: OMIT ALL PARTS DESIGNATED WITH † (DAGGER SYMBOL).

LAMBDA
ELECTRONICS
MELVILLE, NEW YORK
DIVISION OF Veeco INSTRUMENTS INC.

rol and Digital Panel Meter for System 9.


5 - Year
Guarantee
We warrant each instrument manufactured by us, and sold by us or our authorized agents, to be free from defects in material and workmanship, and that it will perform within applicable specifications for a period of five years after original shipment. Our obligation under this guarantee is limited to repairing or replacing any instrument or part thereof, (except tubes and fuses) which shall, within five years after delivery to the original purchaser, be returned to us with transportation charges prepaid, prove after our examination to be thus defective.
We reserve the right to discontinue instruments without notice, and to make modifications in design at any time without incurring any obligation to make such modifications to instruments previously sold.

LAMBDA ELECTRONICS
515 BROAD HOLLOW ROAD • MELVILLE, L.I., NEW YORK • 516-694-4200

DIVISION of Veeco INSTRUMENTS INC.